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MONOGRAPH OF THE

OKAPI

BY

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ATLAS

(OF 48 PLATES)

COMPILED WITH THE ASSISTANCE OF

W. G. RIDEWOOD, D.Sc.

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PREFACE.

The preparation of the 'Monograph of the Okapi,' on which Sir Ray Lankester was engaged when he retired from the Directorship of the Natural History Departments of the British Museum, has taken longer than was expected. As the lithographic plates were printed off and the blocks originally intended for use as text-figures were made two years ago, it was suggested that all the illustrations should be published forthwith in the form of an Atlas of Plates without waiting for the text. Sir Ray Lankester concurred cordially in this proposal, and the plates have accordingly been arranged for publication by Dr. W. G. Ridewood, who has also written appropriate legends.

The material on which the Atlas is based consists in the first place of the series of skins, skulls and other bones in the British Museum, and in the second place of specimens which have been lent for the purpose of illustration and of photographs given by museums or private owners. Special thanks are due to Sir H. H. Johnston, G.C.M.G., the late Mr. Boyd Alexander and Major Powell-Cotton for the presentation of specimens of the Okapi, and to the Hon. Walter Rothschild, Mr. Rowland Ward, Mr. W. Eagle Clarke, and the directors of numerous foreign museums for the loan of specimens or for the gift of photographs. The figures which it has thus been possible to put together in Plates 1 and 29—46 illustrate the variability of the skin-markings, while those of skulls shown in Plates 2—18 constitute an important contribution to the discussion of the problem as to the existence of two races of Okapi, with "broad" and "narrow" skulls respectively.

It is doubtful whether the Atlas will be followed by a volume of text at a later date. The necessity for publishing the text is less great than it was when the work was originally projected, in consequence of the appearance of Fraipont's large monograph in 1907, of the paper by M. de Rothschild and H. Neuville in the present year, and of other publications on the same subject. It is hoped, however, that the illustrations will speak for themselves, and that they will be of service as a contribution to our knowledge of the rare animal which forms the subject of this Monograph.

SIDNEY F. HARMER,

Keeper of Zoology.

British Museum (Natural History),

May, 1910.

NOTE AS TO THE OCCURRENCE AND THE ABSENCE OF OSSICONES IN SPECIMENS OF OKAPI, AND AS TO BROAD AND NARROW SKULLS.

The fact that very small, apparently young, "ossicones," destined to develop to full size and to become ankylosed to the skull, have been found in a full-sized specimen of Okapi (Skull C, figured in Plate 4, fig. 1, and Plate 8, fig. 1) makes it uncertain whether the presence of these structures can be rightly regarded as a character of the male, or that their absence is to be held as a character of the female. The large skull C (Rowland Ward's specimen purchased by the British Museum) is not that of an adult, although probably full-grown. In this specimen, as in Sir Harry Johnston's large specimen (Skull A), and in Mr. Boyd Alexander's (Skull D), the three deciduous molars of the upper jaw are still in use. The three individuals were approximately of the same age and sub-adult. In A there is no roughness (though there is a "vascularised" patch as stated in my original description of it) on the frontal bone corresponding to the attachment of an ossicone, and hence I concluded (when describing it ten years ago), in view of its large size, that this individual was permanently hornless. But it is necessary to mention here that the taxidermist, who mounted the skin belonging to this skull for the British Museum, found a small fibrous body on each side in the integument of the head corresponding in position to the ossicones, and I do not doubt (now that the small bony ossicones of Skull C, found in the same position, have become known to me) that these little lumps in the specimen A were commencing ossicones. Unfortunately they were not preserved. In Ward's specimen (Skull C) the skull is as free from any rough growth, indicating the attachment of the ossicone on either side, as it is in Sir Harry Johnston's specimen (Skull A). On the other hand, the skull (D) of Mr. Boyd Alexander's specimen has a roughly marked area on each frontal bone and two fairly large but immature ossicones, which, though separate, fit on to the roughened patches. I have had, it therefore appears, no Okapi skull in my hands which was devoid of ossicones or detached commencements of them, and yet was adult or sub-adult. On the other hand, M. Fraipont has recorded at least one such specimen, and this (No. 489) was transmitted to the Tervueren Museum as that of a female (Plate 16, fig. K). Though it may very possibly be the case that the adult female Okapi has no ossicones, I think that it must be regarded as still a doubtful question as to whether this is the case. Full-grown skulls without ossicones may develop these structures later. The rare absence of ossicones in a truly adult specimen may be due, not to sex, but to individual variation. In marked contrast to the Okapi, the Giraffe is born with the ossicones in a soft uncalcified condition

projecting more than an inch from the head. The very late appearance of the ossicones in the Okapi is a generic character, and possibly applies to the female as well as the male. At present we do not really know any characters indicating the sex of skins or skulls of Okapi. Of the series of skulls measured by me, five are markedly broader than the rest, giving, as explained in the diagrams, the indices 198·9 (C, Ward's B. M.), 197·7 (J, Johnston's smaller), 190·4 (O, Genoa), 189 (A, Johnston's larger), 189 (E, Powell-Cotton private collection). The rest range from 179 to 150. It seemed to me at one time that possibly a difference of sex might go with the difference in breadth of skull, but I have not been able to bring any evidence in favour of that hypothesis, and, moreover, though the relation given in my measurements is a simple statement of fact, I am not satisfied with it as a correct expression of the character of the skull which suggests the term "broadness." Any measurement of the proportion of breadth to length in Okapi skulls is complicated by the variation in the proportionate length of the premaxillæ, the nasals, the frontals, and the occipital region of the skull. Another character which differs in the skulls studied by me is the form of the orbital margin, which in some cases tends to be somewhat quadrangular, whilst in others it is more nearly circular. For illustrations of this structure and of the præorbital tubercle, which varies also in form and prominence, reference should be made to Plates 8, 9, 10, 11 and 12.

The asymmetry of the skull of Okapi, especially in regard to the size and the direction of the axes of the ossicones, is noteworthy. Sometimes the right and sometimes the left ossicone is the longer (compare Plate 2 with Plate 5).

It appears that not only in the striping of the skin, but in regard to many osteological features such as breadth of skull, proportions of cranial bones, exact form of sutures, size of tympanic bulla, size and skewness of ossicones, early or later development of the latter, and as to many features in the proportions of the "apophyses" or processes of the vertebræ (see Plates 23—28), there is a very large range of variation in Okapis, no two specimens being closely alike. The range of variation is indicated in the illustrative figures contained in this atlas, and seems to me remarkable. At the same time I must emphasise the fact that I have not been able to find any records of the presence or absence of such variations in a series of specimens of any other wild mammal occurring in a limited area such as that inhabited by the Okapi, and I am unable to say (without further examination of series of the kind—not easily to be brought together—say, of a species of Antelope, or of *Bos* or other such Pecorine genus) that Okapi is really exceptional in the amount of individual variation which specimens of it present.

E. RAY LANKESTER.

July, 1910.

LIST OF THE PLATES.

Information concerning the Skulls A—P is given in the Explanation of Plates 13—17, in the pages preceding Plate 13.

Plate 1.—Coloured figures of the bandoliers of Okapi skin sent to Dr. P. L. Sclater by Sir Harry Johnston in 1900 (the two co-types of *Equus* (?) *johnstoni*, Sclater, now in the British Museum), and of the hind quarters of the mounted specimens in the British Museum presented respectively by Sir Harry Johnston and Major Powell Cotton.

Plate 2.—Coloured figures of the horns (ossicones) of Okapi skull in the Muséum d'Histoire Naturelle, Paris. (This skull is that denoted Skull P in the list preceding Plate 13.) *a*, in fig. 2, the line of erosion of the extremity of the ossicone; *b*, the hard white extremity of the ossicone that protrudes through the skin. These figures were prepared in Paris for Sir Ray Lankester under the kind supervision of Prof. Edmond Perrier.

Plate 3.—Dorsal views of Skulls A and B. Skull A is that presented to the British Museum by Sir Harry Johnston; the premaxillæ are wanting in the actual specimen and are drawn of a pale tint, as also in Plate 4, fig. 1, and in Plate 8. Skull B is that purchased by the British Museum of Major Powell-Cotton.

Plate 4.—Dorsal views of Skulls C and D, and figures of ossicones of Skull C. In figs. 1a, 1b, and 1c the ossicones are drawn of the natural size, not half natural size as stated on the plate. Skull C is that purchased by the British Museum of Mr. Rowland Ward; Skull D is that presented to the British Museum by the late Mr. Boyd Alexander.

Plate 5.—Dorsal views of Skulls D and E. Skull D is that presented to the British Museum by the late Mr. Boyd Alexander; Skull E is that in Major Powell-Cotton's private collection.

Plate 6.—Palatal views of Skulls D and E. Skull D is that presented to the British Museum by the late Mr. Boyd Alexander; Skull E is that in Major Powell-Cotton's private collection.

Plate 7.—Palatal views of Skulls F and B. Skull F is that in the Hon. Walter Rothschild's museum at Tring; Skull B is that purchased by the British Museum of Major Powell-Cotton.

Plate 8.—Side views of Skulls C and A. Skull C is that purchased by the British Museum of Mr. Rowland Ward; Skull A is that presented to the British Museum by Sir Harry Johnston. *a*, in fig. 1, the rudimentary ossicone in position. Compare with figs. 1a, 1b, and 1c in Plate 4.

Plate 9.—Side view of Skull B, and figures of ossicones and teeth of the same. Skull B is that purchased by the British Museum of Major Powell-Cotton.

Plate 10.—Side view of Skull E, and figures of teeth of the same, and of the præorbital tubercle of Skulls B, D, and E. Skull E is that in Major Powell-Cotton's private collection; Skull B is that purchased by the British Museum of Major Powell-Cotton; Skull D is that presented to the British Museum by the late Mr. Boyd Alexander. x, in fig. 1, the hard white tip of the ossicone which protrudes through the skin. Compare with *b* in Plate 2, fig. 2.

PLATE 11.—Side view of Skull D, and figures of ossicone and teeth of the same. Skull D is that presented to the British Museum by the late Mr. Boyd Alexander. In fig. 4 the letter *c* has been placed too much to the right; the canine is the left-hand tooth of the three.

PLATE 12.—Side and dorsal views of Skull G. Skull G is that in the Royal Scottish Museum, Edinburgh.

PLATES 13—17.—Dorsal views of Skulls A—P. For explanation see the pages preceding Plate 13.

PLATE 18.—Dorsal view of Skull B with ossicones in position—in Plate 3, fig. 2, the skull is drawn with the ossicones removed—and sagittal section of the same. Skull B is that purchased by the British Museum of Major Powell-Cotton.

PLATE 19.—Line diagrams showing the angles between certain bones in skulls of the Ox, Elk, Okapi, Elephant, and Man.

PLATES 20—22.—The last three cervical and first two dorsal vertebræ of Okapi (Plate 20), Giraffe (Plate 21), Ox and Camel (Plate 22).

PLATES 23—28.—The last cervical and first dorsal vertebræ of the Okapi skeleton in the Hon. Walter Rothschild's museum at Tring compared with those of the skeleton in the British Museum purchased of Major Powell-Cotton.

PLATES 29—40.—Leg stripes of the Okapi. For explanation see the page preceding Plate 29.

PLATES 41, 42.—Bandoliers of Okapi skin, lent by Major Powell-Cotton.

PLATE 43.—Bandoliers of Okapi skin, lent by Major Powell-Cotton; and head of the Okapi presented to the British Museum by the late Mr. Boyd Alexander.

PLATE 44.—Side views of the mounted specimens of Okapi in the British Museum presented respectively by Sir Harry Johnston and the late Mr. Boyd Alexander.

PLATE 45.—Side views of the mounted specimen of Okapi in the British Museum presented by Major Powell-Cotton, and that in the Royal Scottish Museum, Edinburgh.

PLATE 46.—Photograph of a living Okapi calf, and side view of the mounted specimen of Okapi in the Hon. Walter Rothschild's museum at Tring.

PLATE 47.—Tails of Okapi.

PLATE 48.—Diagrams showing the slope of the hair on the head of the Okapi.

Fig. 1.

Fig. 3.

Fig. 2.

Fig. 4

COLOUR OF THE OKAPI.

CARL HENTSCHEL.

Fig. 1. *Sir Harry Johnston's specimen.* *Fig.* 2. *Major Powell-Cotton's specimen.*
Figs. 3 *and* 4. *Bandoliers sent by Sir Harry Johnston in* 1900.

Fig 1

Fig 2

Skull A.

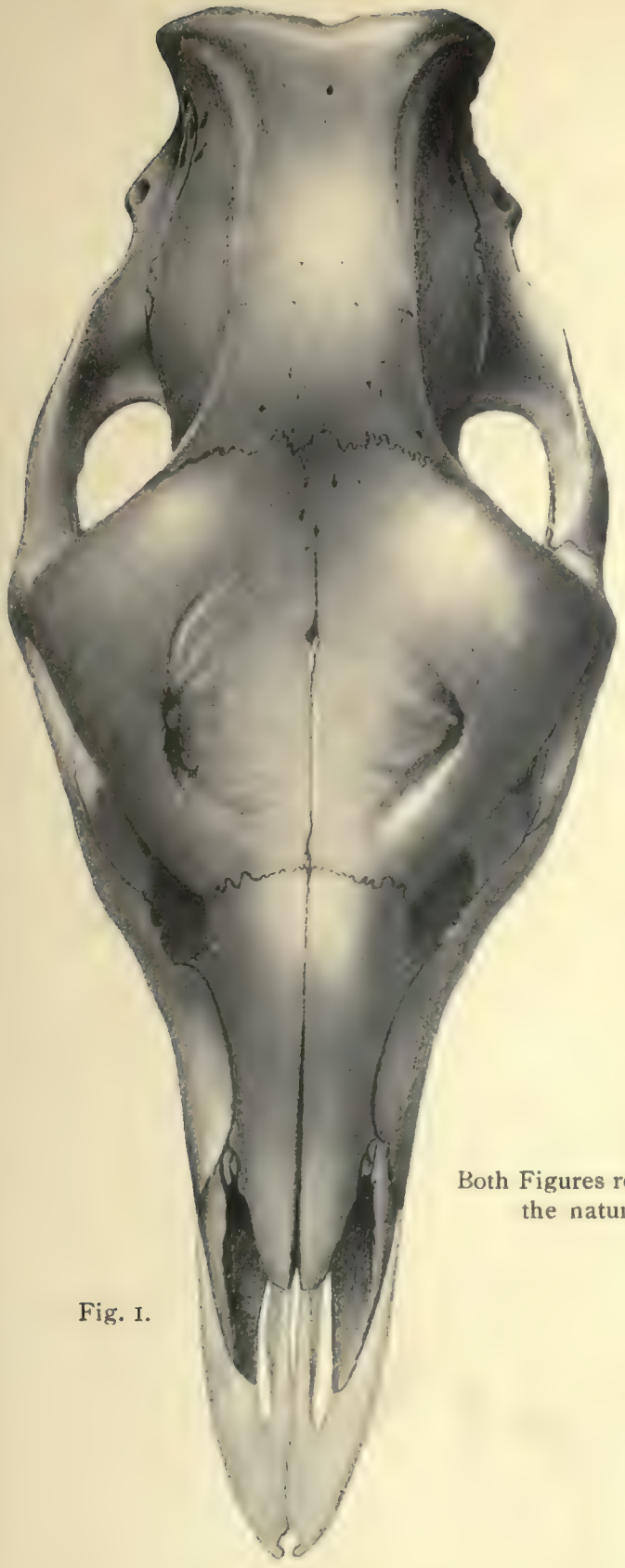

Fig. 1.

Skull B.

Fig. 2.

Both Figures reduced to half the natural size.

H. GRÖNVOLD DEL.

J. GREEN. PHOTO

Fig. 1. Skull A. Sir Harry Johnston's specimen, presented to B.M.

Fig. 2. Skull B. Major Powell Cotton's specimen purchased with skeleton by B.M.

Skull C.

Skull D.

Fig. 1.

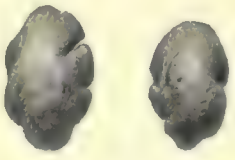

Fig. 1 a.

Fig. 1 b.

Fig. 1 c.

Fig. 2.

All the figures reduced to half of the natural size.

Fig. 1. Skull C. Mr. Rowland Ward's Specimen, purchased by B. M.

Fig. 1a, b, c. Top, lateral and basal view of the pair of rudimentary ossicones.

Fig. 2. Skull D. Mr. Boyd Alexander's specimen presented to B. M.

Skull D. bis.

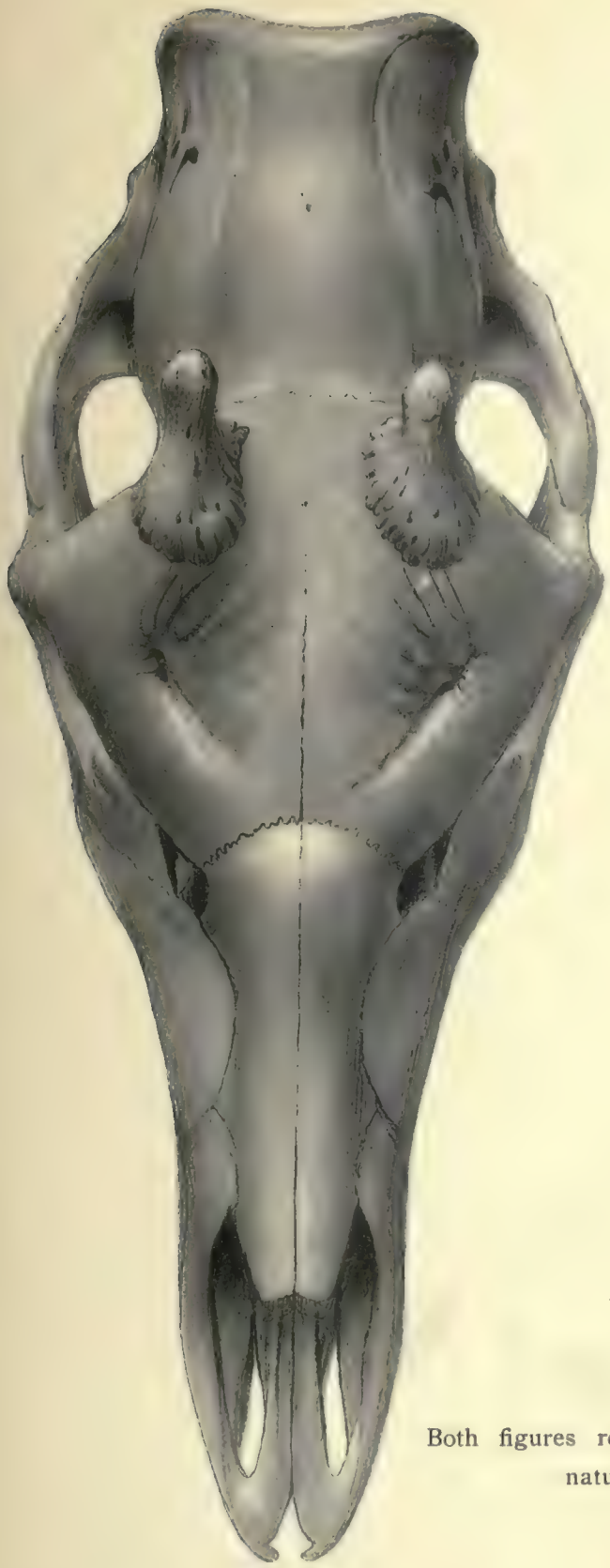

Fig. 1.

Skull E.

Fig. 2.

Both figures reduced to half the natural size.

GRØNVOLD DEL. J. GREEN, PHOTO

Fig. 1. Skull D. bis. Mr. Boyd Alexander's specimen with the horn-cones in position.
Fig. 2. Skull E. Major Powell Cotton's second specimen (in his private collection).

Skull D.

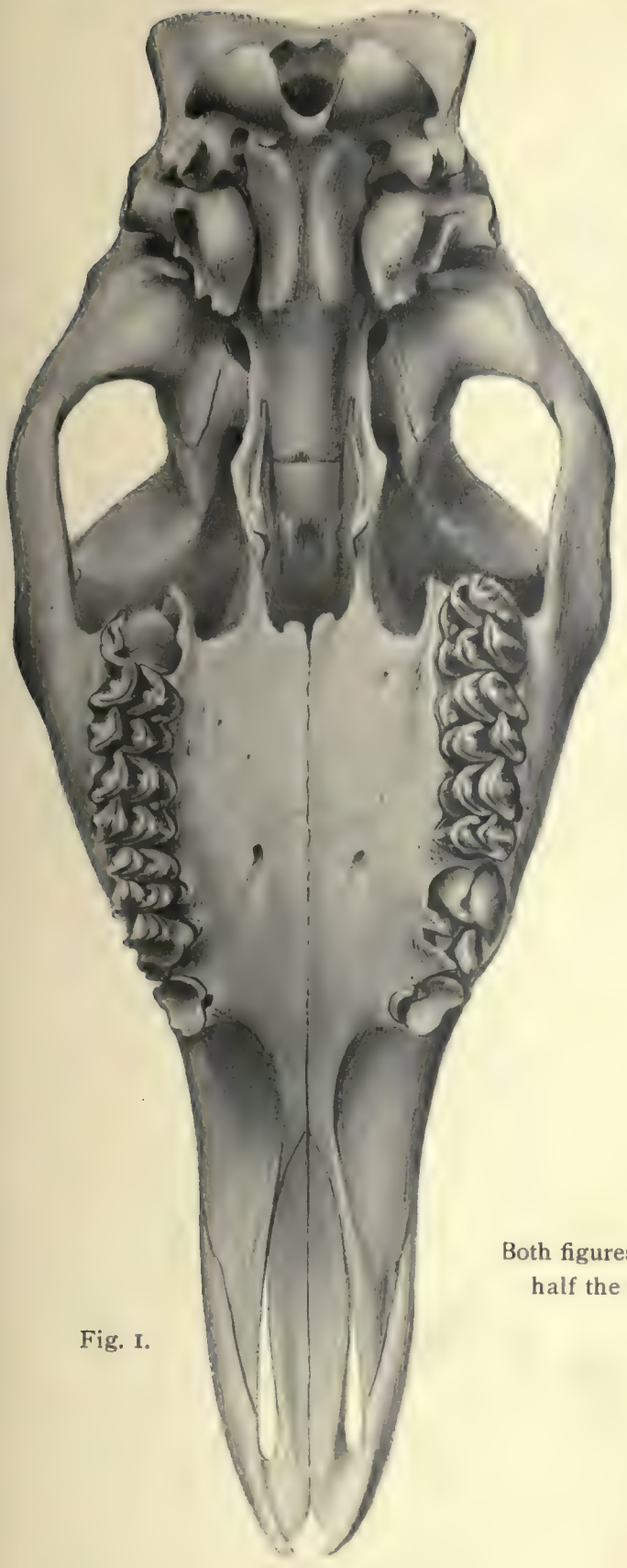

Fig. 1.

Skull E.

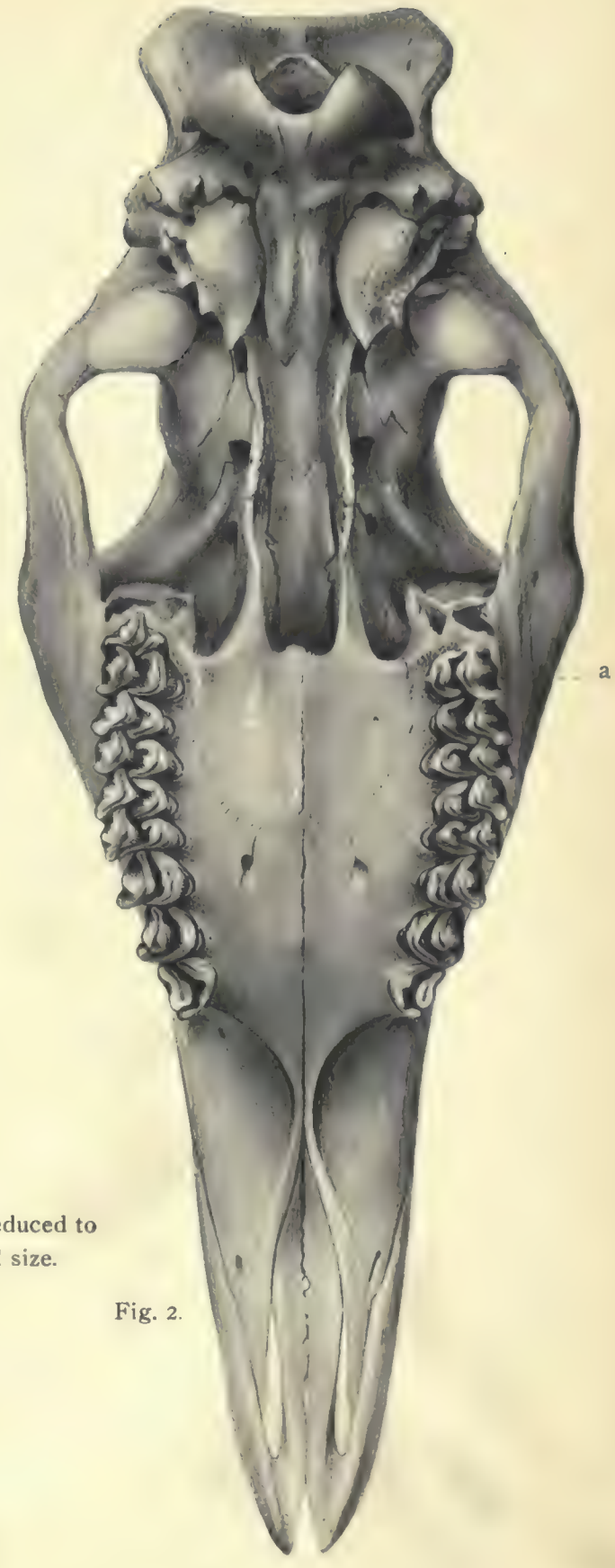

Fig. 2.

Both figures are reduced to half the natural size.

M. GRONVOLD DEL.

J. GREEN, PHOTO.

Fig. 1. Skull D. Mr. Boyd Alexander's specimen presented to the B.M.

Fig. 2. Skull E. Major Powell Cotton's second specimen in his private collection.

(a) The abnormal posterior molar of the right side.

Skull F.

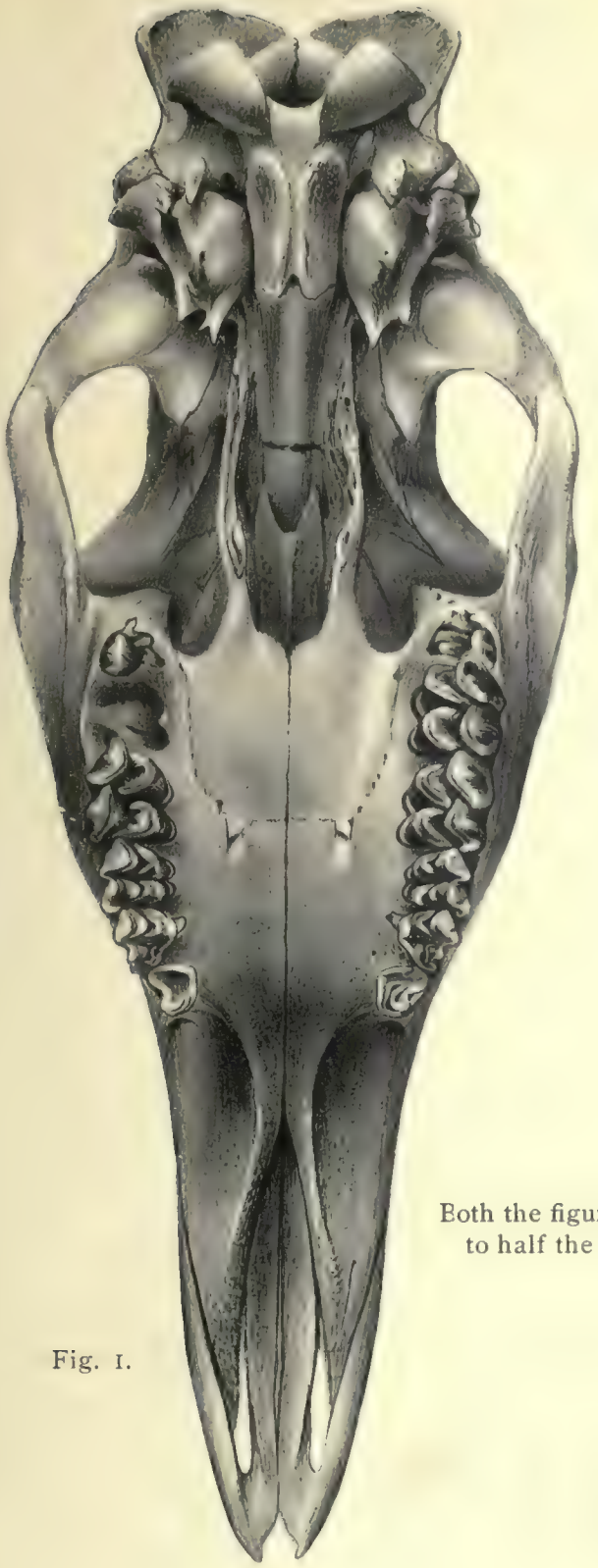

Fig. 1.

Skull B.

Fig. 2.

Both the figures are reduced to half the natural size.

H. GRONVOLD DEL. J. GREEN. PHOTO

Fig. 1. Skull F. Hon. Walter Rothschild's specimen.

Fig. 2. Skull B. Major Powell Cotton's specimen purchased by the B.M.

Skull C. a

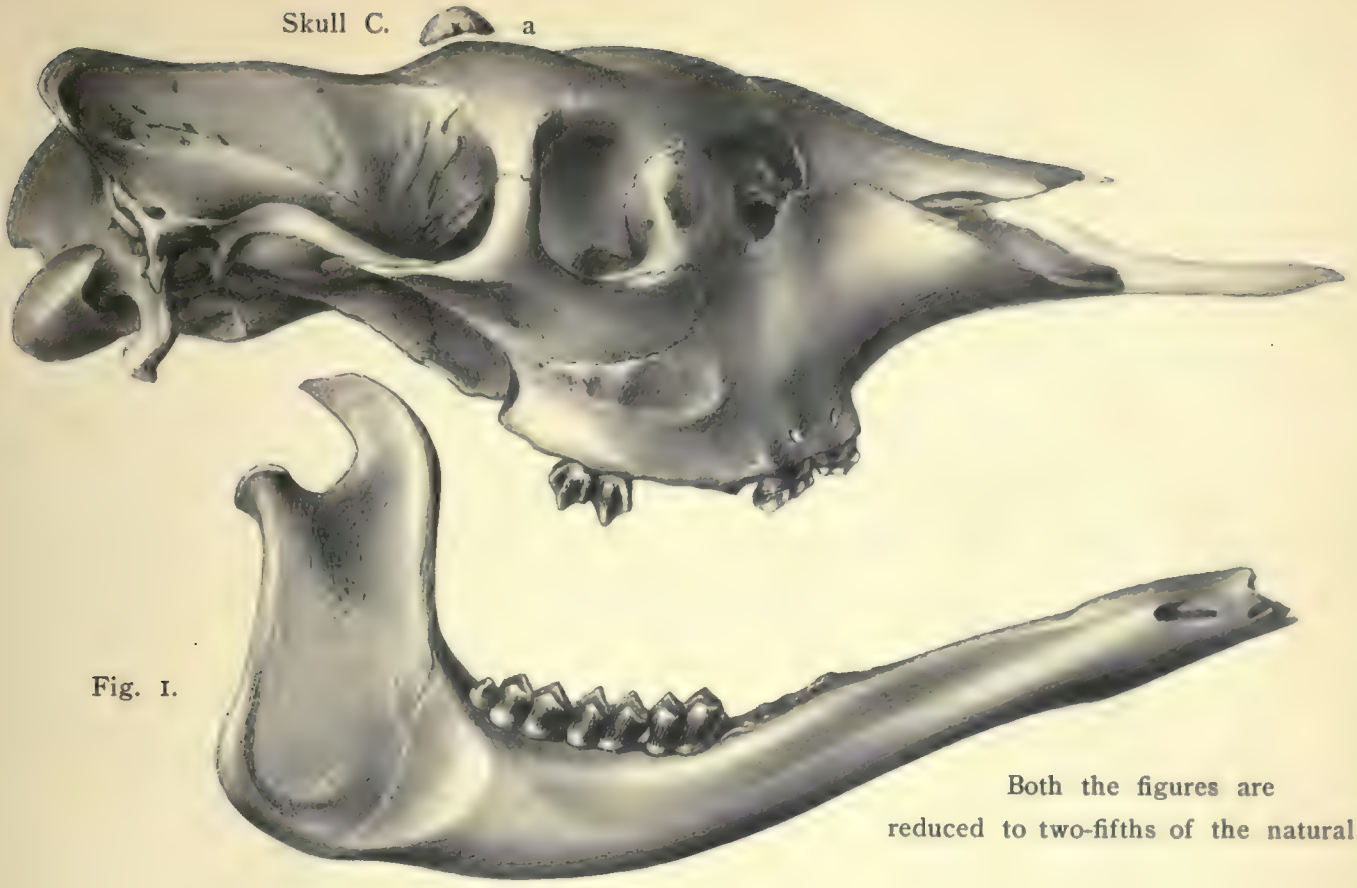

Fig. 1.

Both the figures are reduced to two-fifths of the natural size.

Skull A.

Fig. 2.

H. GRÖNVOLD DEL. J. GREEN, PHOTO

Fig 1. Skull C with lower jaw, purchased by B. M. from Mr. Rowland Ward.

Fig. 2. Skull A with lower jaw, presented to B. M. by Sir Harry Johnston.

Fig. 5.
(nat. size)

H. GRONVOLD DEL.

Fig. 6a.

Fig. 6.
(four-fifths nat. size).

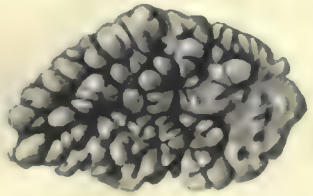

Fig. 7.
(four-fifths nat. size).

Fig 1. (two thirds nat. size).

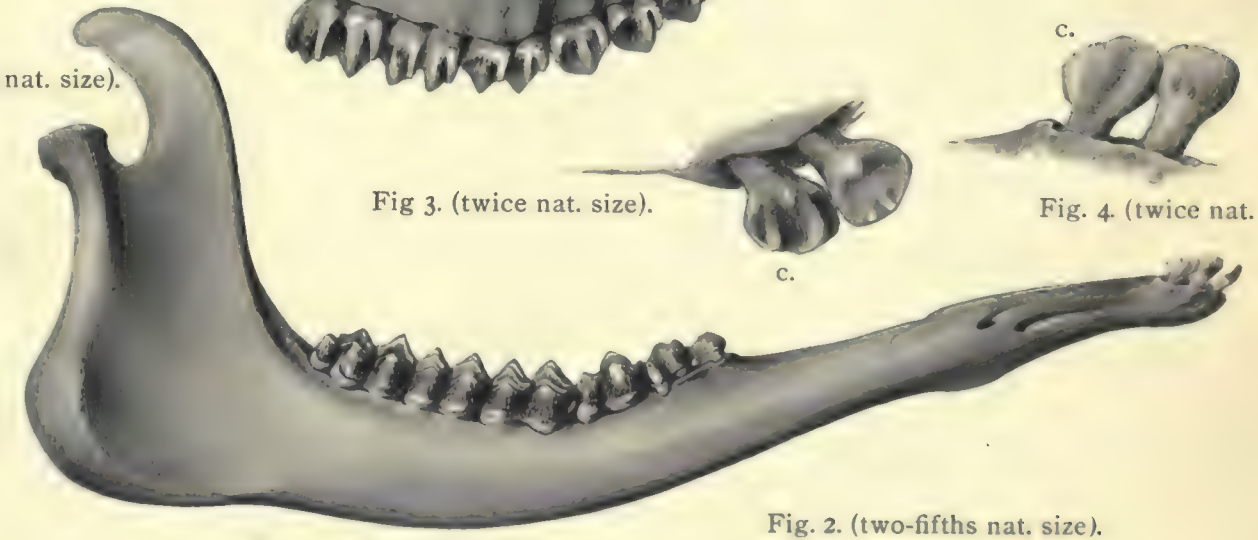

Fig. 2. (two-fifths nat. size).

Fig 3. (twice nat. size).

Fig. 4. (twice nat. size).

J. GREEN, PHOTO.

Skull B. Major Powell Cotton's specimen purchased by the B.M.

Figs. 1 & 2. Skull and lower jaw. Figs. 3 & 4. Inner and outer face of canine and incisor teeth. (c) Canine.

Fig 5. Lower molar series right side. Fig. 6. Immature left horn-cone (ossicone).

Fig. 6 a. Section of same through x—y. Fig 7. Base of same.

x

Fig. 5.

Skull E.

Fig. 1. (two-fifths nat. size).

Fig. 6.

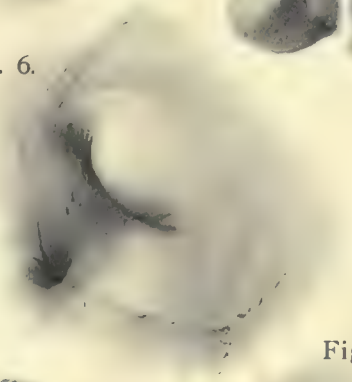

Fig. 7.

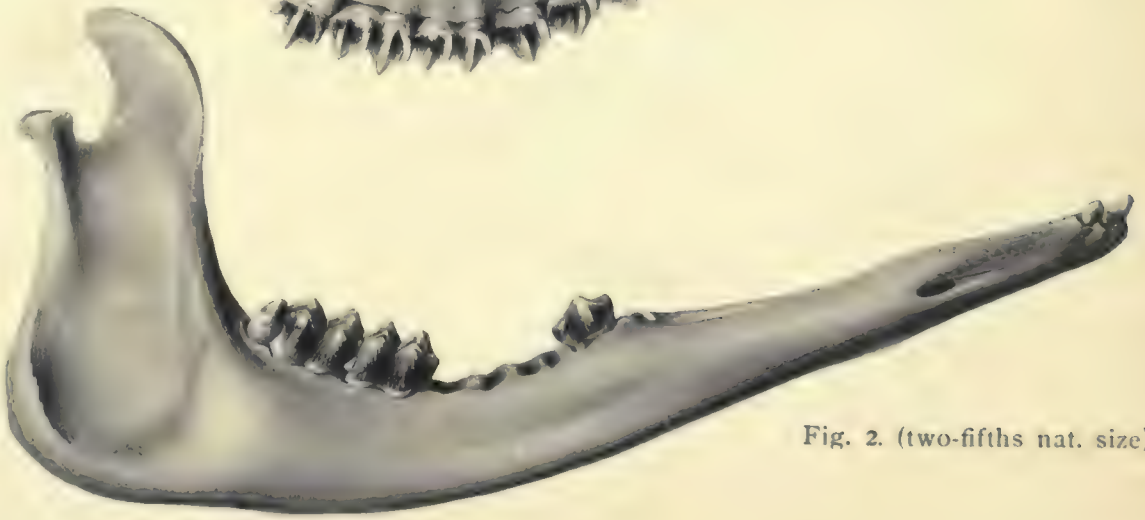

Fig. 2. (two-fifths nat. size).

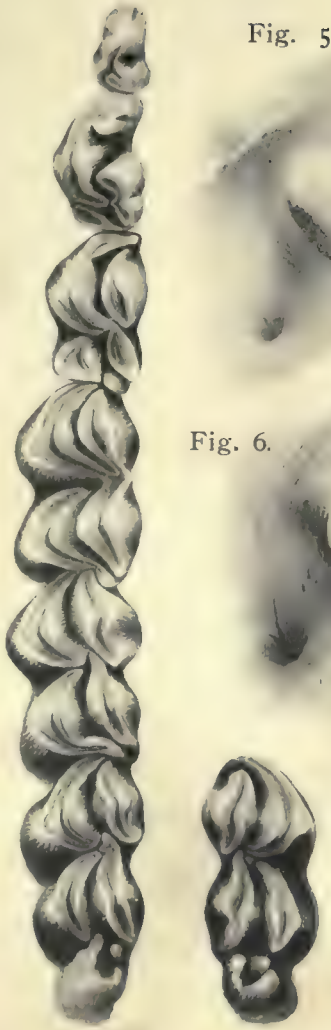

Fig. 3. (nat. size.)

Fig. 4. (nat. size).

M. GRUNVOLD DEL.

J. GREEN, PHOTO.

Skull E. Major Powell Cotton's second specimen (in his private collection).

Figs. 1 & 2. Skull and lower jaw. Fig. 3. Lower molar series, left side Fig. 4. Last molar of right side.

Fig. 5. Præorbital tubercle of Skull B. Fig. 6. Same of Skull D. Fig. 7. Same of Skull E.

Fig. 5. (nat. size.)

Skull D.

Fig. 1. (two-fifths nat. size.)

Fig. 6A.

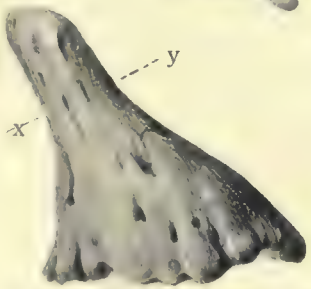

Fig. 6. (four-fifths nat. size).

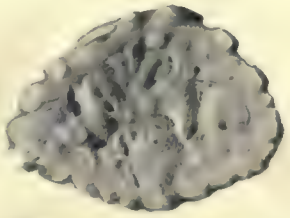

Fig. 7. (four-fifths nat. size).

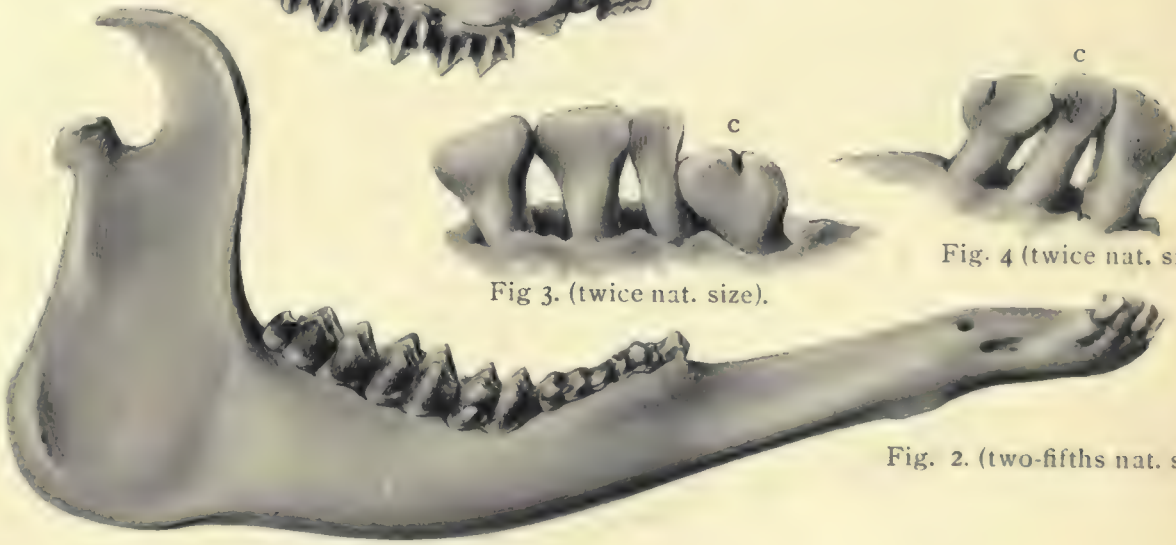

Fig. 2. (two-fifths nat. size.)

Fig 3. (twice nat. size).

Fig. 4 (twice nat. size.)

H. GRONVOLD DEL

J. GREEN PHOTO

Skull D. Mr. Boyd Alexander's specimen, presented to the British Museum.

Figs. 1 & 2. Skull and lower jaw. Figs. 3 & 4. Right and left canine and incisor teeth. (c) canines.

Fig. 5. Lower molar series, right side. Fig. 6. Immature left horn cone (ossicone).

Fig. 6a. Section of same through x—y. Fig. 7. Base of same.

Fig. 1.

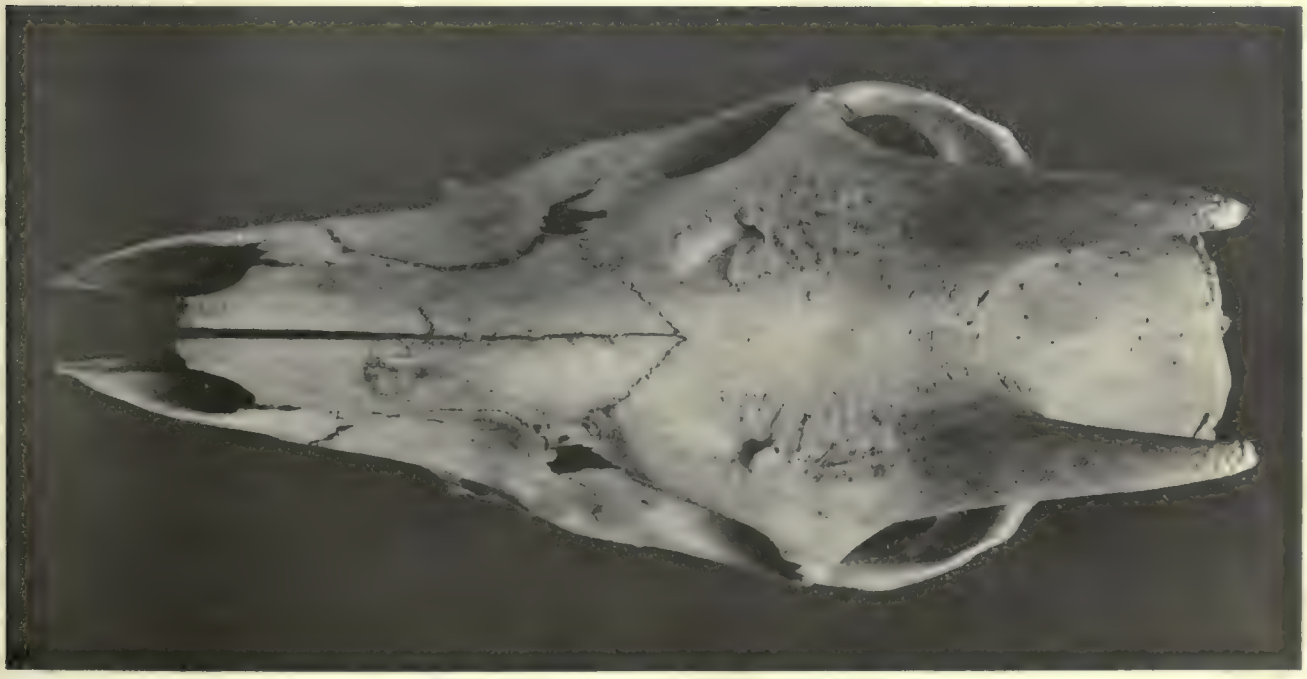

Fig. 2.

Skull G, in the Royal Scottish Museum, Edinburgh. Fig. 1. Left side view. Fig. 2. Dorsal view. Two-fifths natural size. From photographs supplied by Mr. Eagle Clarke.

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PLATES 13–17.

The figures in Plates 13—17 show the dorsal views of fifteen skulls of the Okapi in the British Museum, the Museums of Edinburgh, Tervueren, Rome, Madrid, Genoa, and Paris, and the private collections of Major Powell-Cotton and the Hon. Walter Rothschild, drawn mainly from photographs taken with a telephoto lens, with the basicranial axis of the skull set normally to the line drawn from the centre of the skull to the centre of the lens.

With a view to facilitating a comparison of the length of the nasal region of the various skulls with the postorbital breadth, for the purpose of deciding whether two types of skull, "broad" and "narrow," can be distinguished, dotted lines have been drawn in the figures to explain the method of obtaining the ratios mentioned in the legends beneath the figures. The distance MN is the distance from the front of the suture between the nasal and premaxillary bones to the outer end of the suture between the nasal and frontal bones, that is, to the foremost point of the frontal bone. This distance gives a fair indication of the length of the facial parts of the skull. The distance from the front of the premaxillary bones would possibly have been a better criterion, but the selection of the above measurement was largely determined by the absence of the premaxillæ in some of the skulls. The distance EE is the maximum width of the skull in the region of the postorbital arch. This gives a fair indication of the breadth of the skull as a whole. The ratio EE (or MM) to MN gives roughly the breadth of the skull in terms of the length of the facial parts. Thus, in skull C the ratio EE (or MM) to MN is 198·9 : 100, in skull B it is 179·3 : 100; so that C is a relatively broader skull than B.

The fifteen Okapi skulls specially studied are for convenience denoted by the letters A—P. The particulars of these, so far as concerns the illustrations published in this Atlas, are as follows:—

Plate 13.

Skull A.—In the British Museum; Reg. No., 1.8.9.51; presented by Sir Harry Johnston in 1901. Sex doubtful: when first described supposed to be female because of absence of ossicones, soft rudiments of which were, however, present; young, about two thirds grown. Locality: Semliki Forest, near Lake Albert Edward. The skull is figured by E. Ray Lankester, 'Trans. Zool. Soc.,' 1902, vol. xvi, plates xxxi and xxxii, and pp. 284 and 290. Figured also in Plates 3 and 8 of this Atlas. This skull, with the corresponding skin (see Plate 44, fig. 1), is the type of *Okapia erikssoni*, Lankester ('Ann. Mag. Nat. Hist.,' ser. 7, x, 59, November, 1902, p. 417).

Skull B.—In the British Museum; Reg. No., 6.12.27.1; part of a complete skeleton

purchased of Major Powell-Cotton in 1906. Definitely stated by Major Powell-Cotton to be male, not quite adult. Locality: Ituri Forest, Makala. This skull is figured also in Plates 3, 7, 9, and 18. The right ossicone is figured by E. Ray Lankester, 'Proc. Zool. Soc.,' 1907, plate vii. The skin corresponding with this skull is that shown in Plate 45, fig. 1.

Skull C.—In the British Museum; Reg. No., 7.12.25.1; purchased of Mr. Rowland Ward in 1907. Young; sex doubtful; the skin is mounted as though male; see Plate 32, fig. 1. Locality; Ituri Forest. This skull is also figured in Plates 4 and 8. The ossicone is figured by E. Ray Lankester, 'Proc. Zool. Soc.,' 1907, p. 128.

Plate 14.

Skull D.—In the British Museum; Reg. No., 7.7.8.264; presented by the late Mr. Boyd Alexander in 1907. Young male; the body was examined by Mr. Boyd Alexander (see 'From the Niger to the Nile,' ii, London, 1907, p. 264). Locality: Welle River, near the northern border of the Congo Free State. This skull is figured also in Plates 4, 5, 6, and 11. The ossicone is figured by E. Ray Lankester, 'Proc. Zool. Soc.,' 1907, p. 134. The skin corresponding with this skull is that figured in Plate 44, fig. 2.

Skull E.—In Major Powell-Cotton's private collection. Adult male. Taken alive in a pit between the 20th and 30th of September, 1906, at two hours' march from the chief Akurupi's village of Maliangi, on the north side of the River Lindi, and opposite to the post of Makala. This skull is figured also in Plates 5, 6, and 10.

Skull F.—In the Hon. Walter Rothschild's museum at Tring. Young, sex doubtful. Locality: unknown. The skull is part of a nearly complete skeleton. Figured also in Plate 7. The skin corresponding with this skull is that figured in Plate 46, fig. 2.

Plate 15.

Skull G.—In the Royal Scottish Museum, Edinburgh. The skin is mounted as though the animal were male; the sex, however, is doubtful; adult. Locality: Ituri Forest. The skull is also figured in Plate 12. A small figure of the skull is published in R. Lydekker's 'The Game Animals of Africa,' 1908, p. 379, fig. 79. The ossicone is figured by E. Ray Lankester, 'Proc. Zool. Soc.,' 1907, p. 131, and plate vi. The skin corresponding with this skull is that figured in Plate 45, fig. 2.

Skull H.—In the British Museum; Reg. No., 7.12.25.2; a cast purchased of Mr. Rowland Ward in 1907; the actual skull went to America. Supposed to be male, but sex doubtful; adult. Locality: doubtful. The ossicone of this skull is figured by E. Ray Lankester, 'Proc. Zool. Soc.,' 1907, plate vi, figs. 9—12.

Skull J.—In the British Museum; Reg. No., 1.8.9.52: presented by Sir Harry Johnston in 1901. Sex doubtful; young. Locality: Semliki Forest, near Uganda frontier, 4000 ft. This is the smaller of the two skulls presented by Sir Harry Johnston, the other being Skull A. It is figured by E. Ray Lankester, 'Trans. Zool. Soc.,' 1902, vol. xvi, plates xxxi and xxxii.

Plate 16.

Skull K.—In the Tervueren Museum (Musée du Congo), Belgium; the skull of a complete skeleton, No. 489. Said to be female, adult. Locality: Ituri Forest. This skull is figured by C. I. Forsyth Major, 'Proc. Zool. Soc.,' 1902, vol. ii, p. 342, text-fig. 63, and by J. Fraipont, 'Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, plates v and vii. The figure of Skull K in Plate 16 is from Forsyth Major's figure. Although obtained at the same time as skin No. 488, now at Rome (see Plate 33, fig. 1), the skeleton No. 489 is apparently from a different animal (see Fraipont, p. 14, paragr. 5).

Skull L.—In the British Museum; Reg. No., 7.12.26.1; a cast of a skull in the Tervueren Museum (Musée du Congo), Belgium; the skull of a complete skeleton, No. 480. Said to be male, adult. Locality: Mundalah, on the road from Mawambi to Beni. The skull is figured by C. I. Forsyth Major, 'Proc. Zool. Soc.,' 1902, vol. ii, p. 73, text-fig. 7, and p. 343, text-fig. 64; by E. Ray Lankester, 'Trans. Zool. Soc.,' vol. xvi, 1902, p. 304, text-fig. 15; and by J. Fraipont, 'Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, plates iii, iv, and vi, and text-fig. 46 on page 40 *bis*. A figure of the extremity of the ossicone is given by E. Ray Lankester, 'Proc. Zool. Soc.,' 1907, p. 126, text-fig. 49. Skull L is the type of *Okapia liebrechtsi*, Major. The distinctive characters of the species are given in 'La Belgique Coloniale,' Ann. viii, No. 45, November 9th, 1902, p. 533; but the figure of the skull in the 'Proc. Zool. Soc.,' 1902, vol. ii, p. 73, illustrating remarks made by Dr. Forsyth Major at the Society's meeting on June 3rd, 1902, and published in October, 1902, bears the name *Okapia liebrechtsi*, Maj., and stands as the basis of the species. The skin mentioned by Dr. Forsyth Major on the same occasion is now mounted in the Stockholm Museum. The right fore and hind legs of this are shown in Plate 39, fig. 1.

Skull M.—In the Zoological Museum of the University of Rome. Sex doubtful, adult. Locality: Ituri Forest. The skull of a complete skeleton described and figured by A. Carruccio, 'Boll. Soc. Zool. Ital.,' ser. 2, vol. iv, 1903, pp. 1—20 and 101—116, and vol. vi, 1905, pp. 177—190. The skeleton is apparently not that of the same animal as the skin mounted at Rome, of which the legs are figured in Plate 33, fig. 1. According to J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 14, paragr. 5 and 6) the skin given to the King of Italy is No. 488 and the skeleton No. 500. The figure of Skull M in Plate 16 is from a photograph supplied by the University of Rome.

Plate 17.

Skull N.—In the Madrid Museum; the skull of a complete skeleton, apparently the skeleton corresponding with the skin No. 536 mounted in the Tervueren Museum, of which the legs are figured in Plate 37, fig. 2. See J. Fraipont, 'Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 14, parag. 10. Skull N is without horns, and clearly does not correspond with the horned skin mounted in the Madrid Museum (skin No. 705a of J. Fraipont, p. 14, fig. 7), of which the legs are figured in Plate 34, fig.

2, and Plate 35, fig. 3 of this Atlas. The figure of Skull N in Plate 17 is from a photograph supplied by the Madrid Museum.

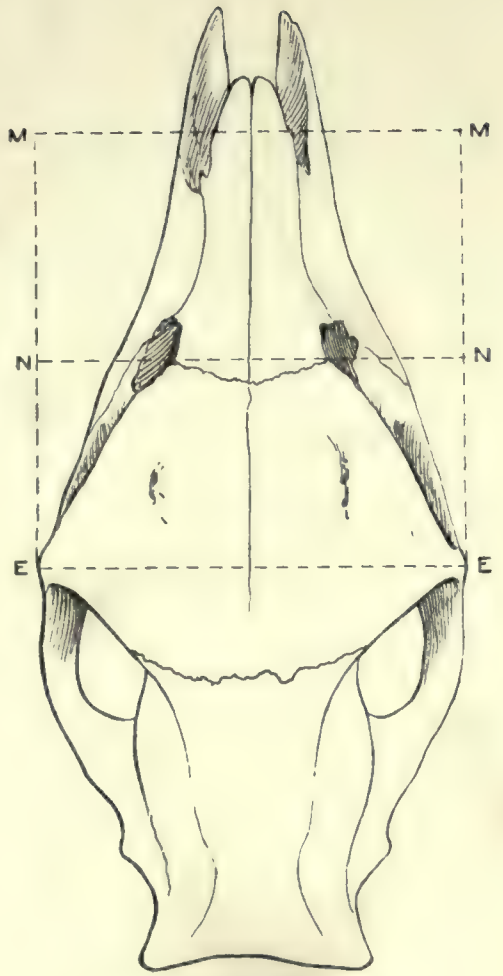
Skull O.—In the Genoa Museum. From a photograph supplied by the Genoa Museum. Skull O is without horns, and is evidently not the skull of the same animal as the skin mounted in the Genoa Museum, of which the legs are figured in Plate 34, fig. 1.

Skull P.—In the Paris Museum (Muséum d'Histoire Naturelle). The skull of a complete skeleton. From a photograph supplied by the Paris Museum. The ossicones are figured in Plate 2. The skull is figured by M. de Rothschild and H. Neuville, 'Ann. Sci. Nat., Zool.,' vol. x, Nos. 1 and 2, 1909, pp. 15, 22, and 29. Apparently this is not the skull corresponding with the mounted skin in the Paris Museum, of which the legs are figured in Plate 35, fig. 1; for although in the paper by Rothschild and Neuville the skeleton and skin are regarded as from the same animal (p. 2, "Un seul spécimen . . . d'Anatomie comparée"), Fraipont states that the skeleton (No. 501) corresponding with the Paris skin (No. 503) went to Stockholm, and that the skin (No. 534) corresponding with the Paris skeleton (No. 535) is at Tervueren ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 14, paragr. 7 and 9). In this case Skull P corresponds with the legs figured in Plate 38, fig. 2.

Eleven of the above fifteen skulls were examined at the British Museum (Natural History), and the relative ages of these may be approximately determined by the following particulars of the dentition and sutures. J is clearly the youngest of the series; the deciduous molars are only moderately worn, and the third true molar has not yet developed. F is somewhat older than J; the three deciduous molars are in use, the third molar is present, but has not yet cut the gum. C is older still; the three deciduous molars are in use, the third molar has cut the gum and is slightly worn. A and D are almost of the same age as C, but a little older; the third molar shows rather more signs of wear. The three deciduous molars are still in use in both. In the extent of wear of the hindermost molar tooth in the lower jaw, and in the fact that the left permanent canine is already in use, D would appear to be slightly older than A; but in D the third deciduous incisor has not been shed, whereas in A it has, and the posterior or fifth cusp of the third molar in the lower jaw is not so freely exposed as in A.

In the following skulls there are no milk teeth remaining. B is a little older than A and D, and E, G, H, K and L are the oldest of the series, and hardly distinguishable the one from the other as regards age. In B the horns or ossicones are not yet ankylosed to the skull, and the parieto-frontal suture is very distinct. In E, G, H and L the ossicones are fused on, and the parieto-frontal suture is obliterated. In K there are no ossicones, and the parieto-frontal suture is obliterated. In E and H the lachrymo-malar and fronto-malar sutures persist; in K the lachrymo-malar suture is present, but not the fronto-malar; in G and L both have disappeared.

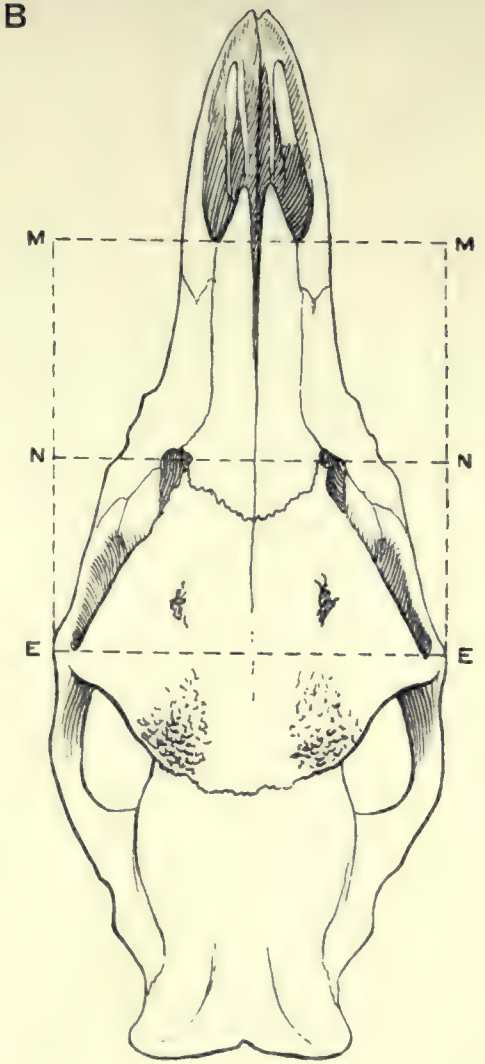
A



Skull A. British Museum; Sir Harry Johnston. Rudiments of unossified ossicones were present in the skin.

Ratio MM : MN = 189·0 : 100.

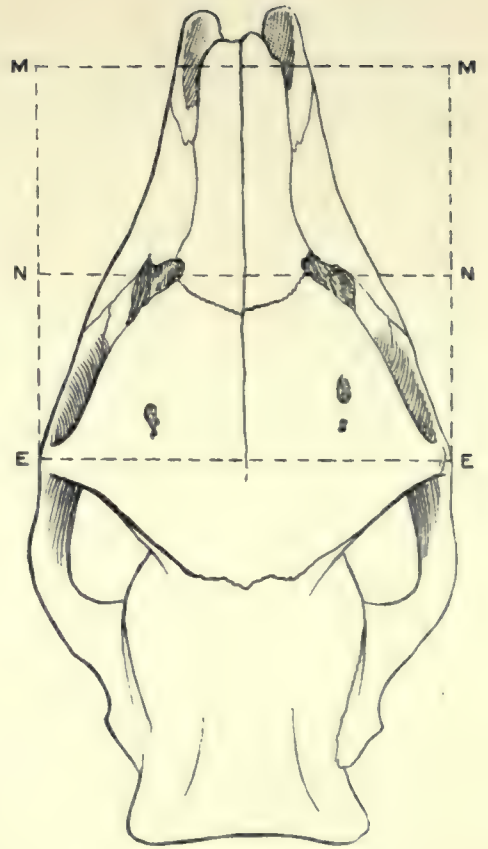
B



Skull B. British Museum; Major Powell-Cotton. This specimen has large separate ossicones.

Ratio MM : MN = 179·3 : 100.

C

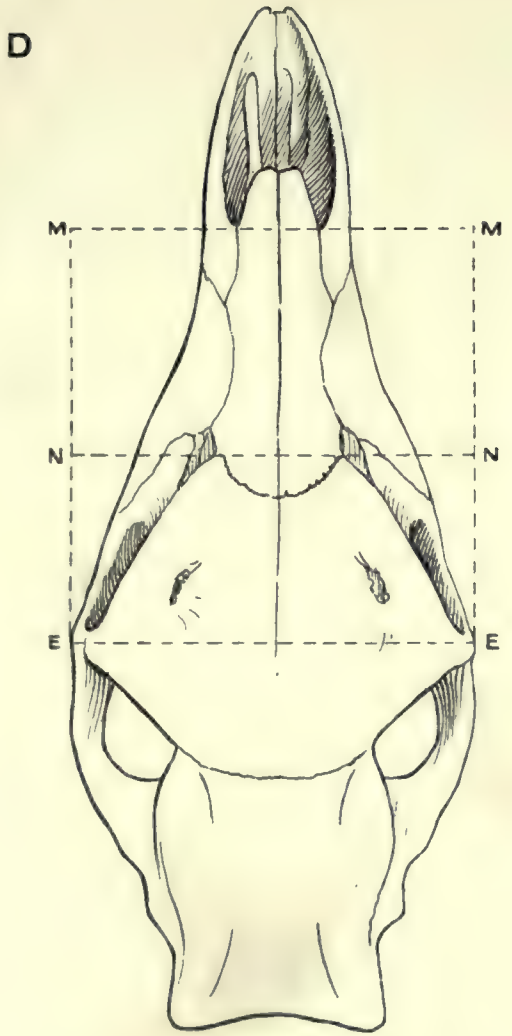


Skull C. British Museum; Mr. Rowland Ward. This specimen has very small (young) separate ossicones.

Ratio MM : MN = 198·9 : 100.

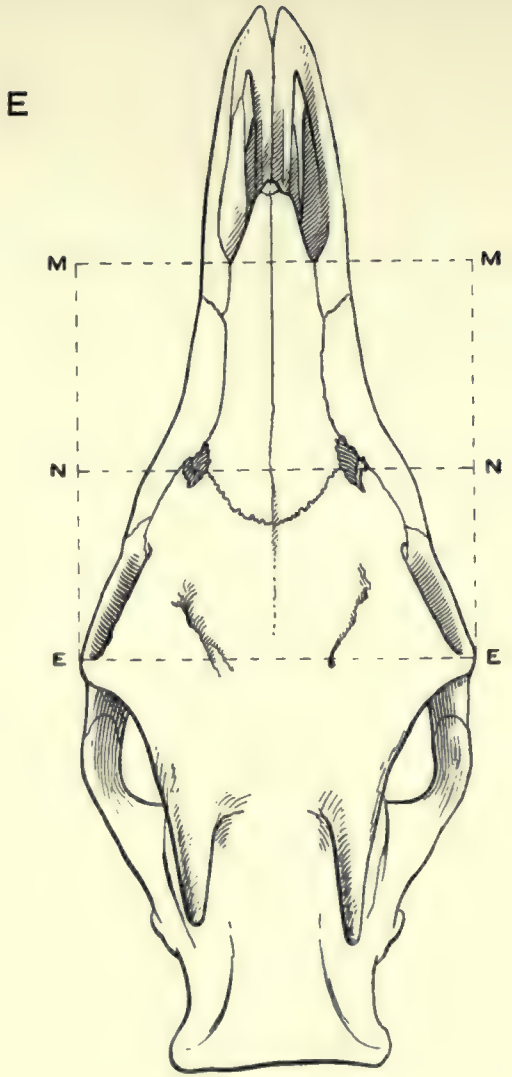
PLATE 13.

ADLARD & SON, IMPR.



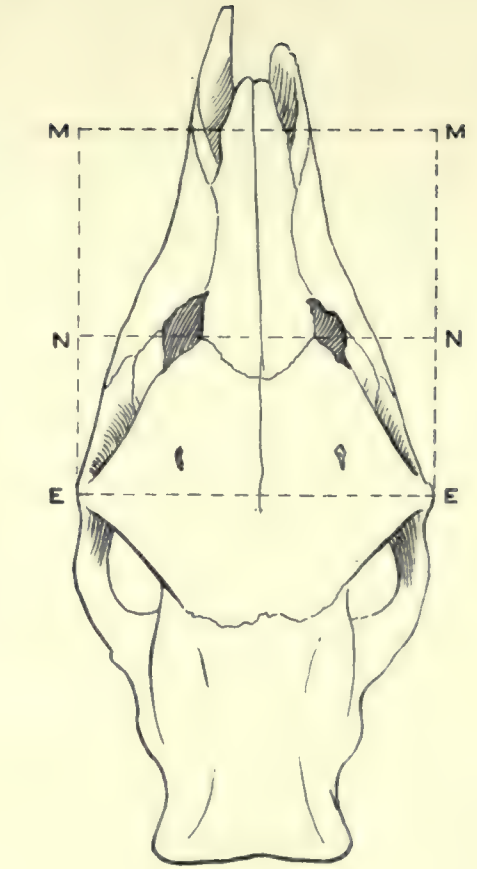
Skull D. British Museum; Mr. Boyd Alexander. This specimen has separate ossicones of moderate size.

Ratio MM : MN = 178·3 : 100.



Skull E. Major Powell-Cotton's private collection.

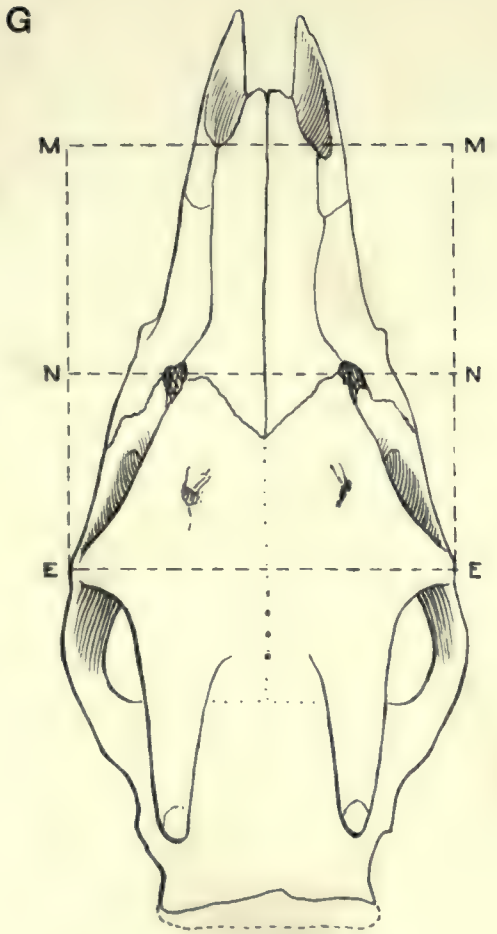
Ratio MM : MN = 189·0 : 100.



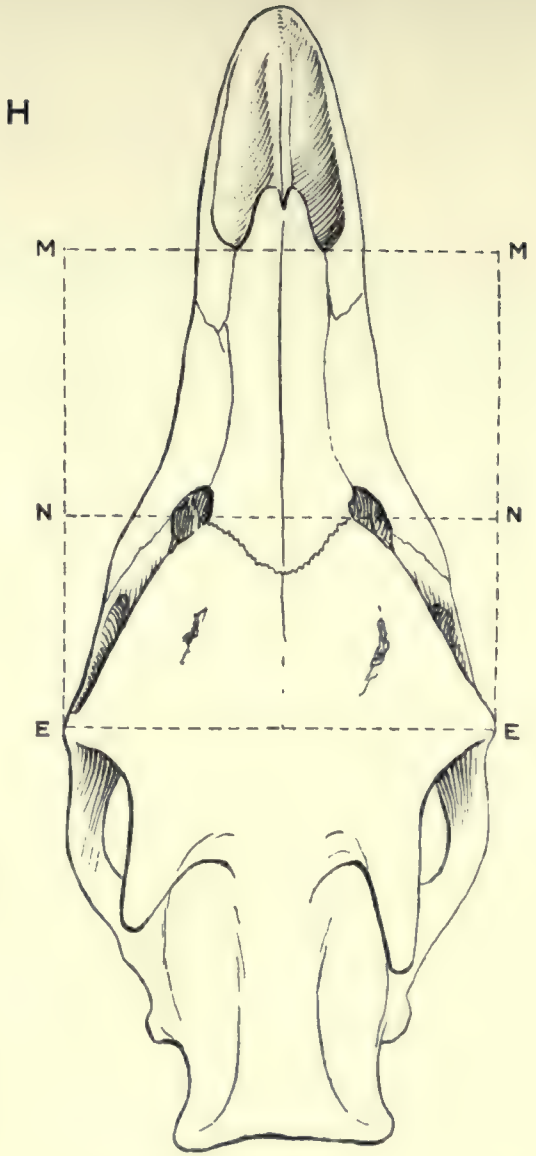
Skull F. Tring Museum; the Hon. Walter Rothschild. No ossicones.

Ratio MM : MN = 172·7 : 100.

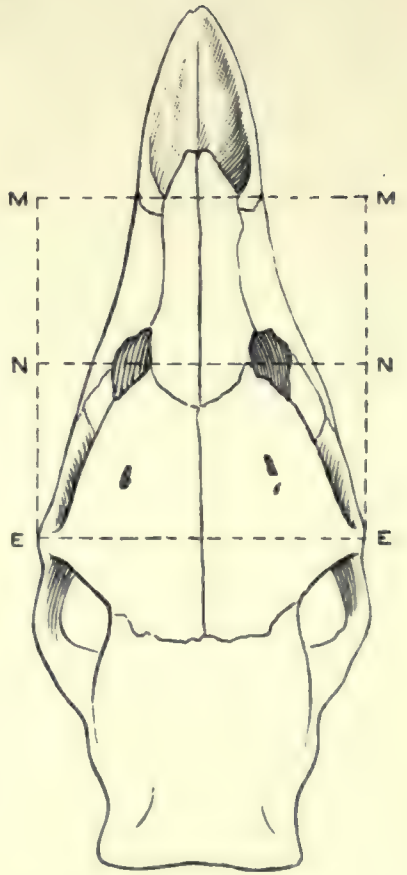
ADLARD & SON, IMPR.



Skull G. Royal Scottish Museum, Edinburgh.
Ratio MM : MN = 170·4 : 100.

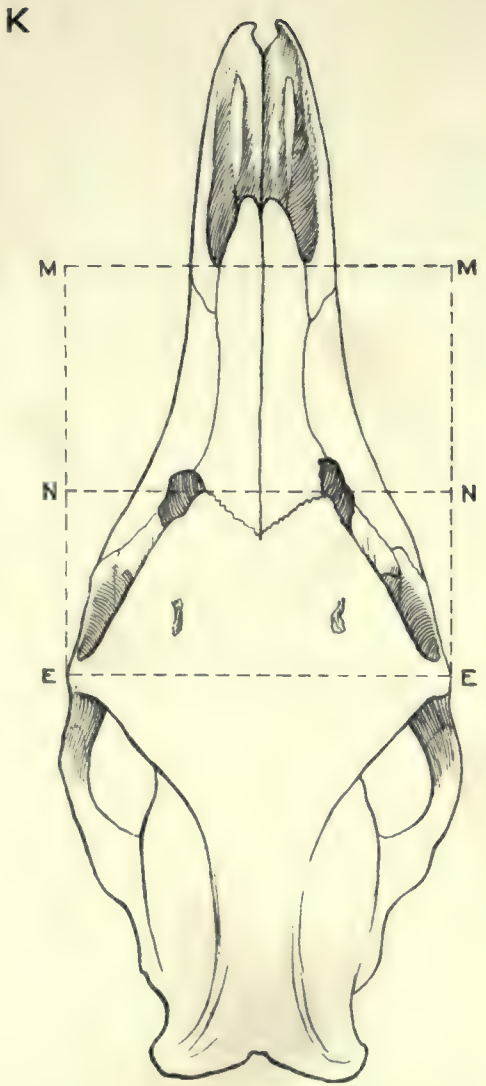


Skull H. British Museum; a cast from Mr. Rowland Ward.
Ratio MM : MN = 162·8 : 100.



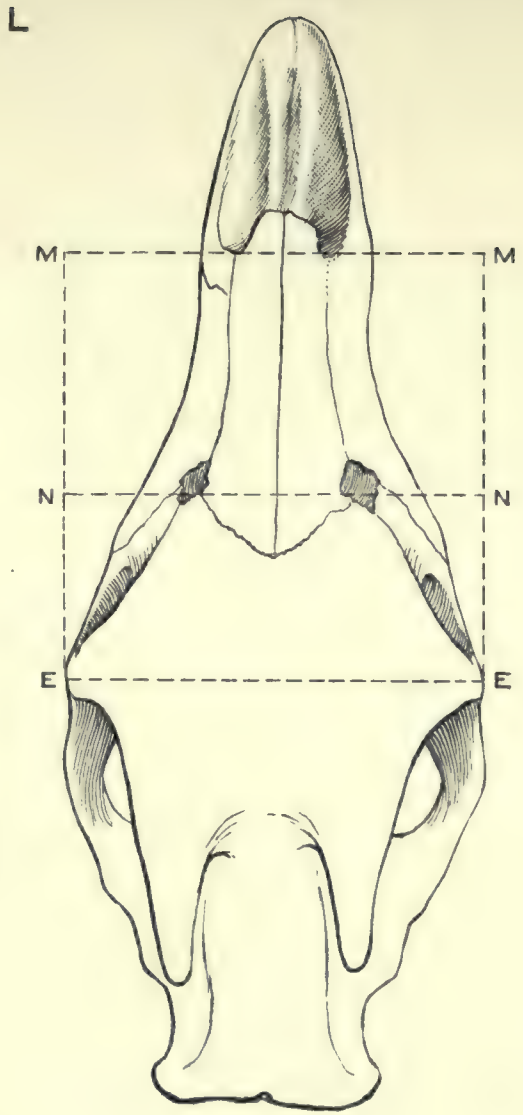
Skull J. British Museum; Sir Harry Johnston (smaller skull). No ossicones.
Ratio MM : MN = 197·7 : 100.

ADLARD & SON, WPTR.



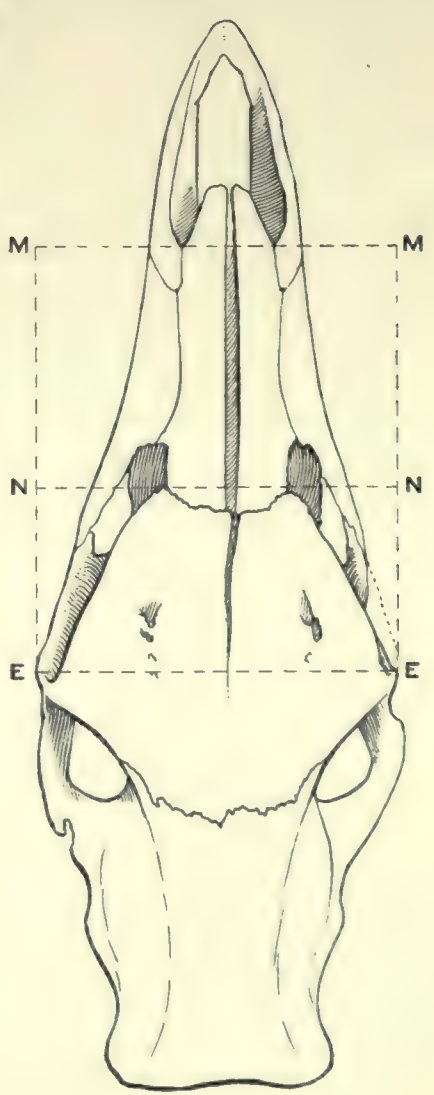
Skull K. Congo Museum, Tervueren, Belgium. No ossicones observed, nor scars for same.

Ratio MM : MN = 171·7 : 100.



Skull L. British Museum; cast of a skull in the Tervueren Museum.

Ratio MM : MN = 173·4 : 100.



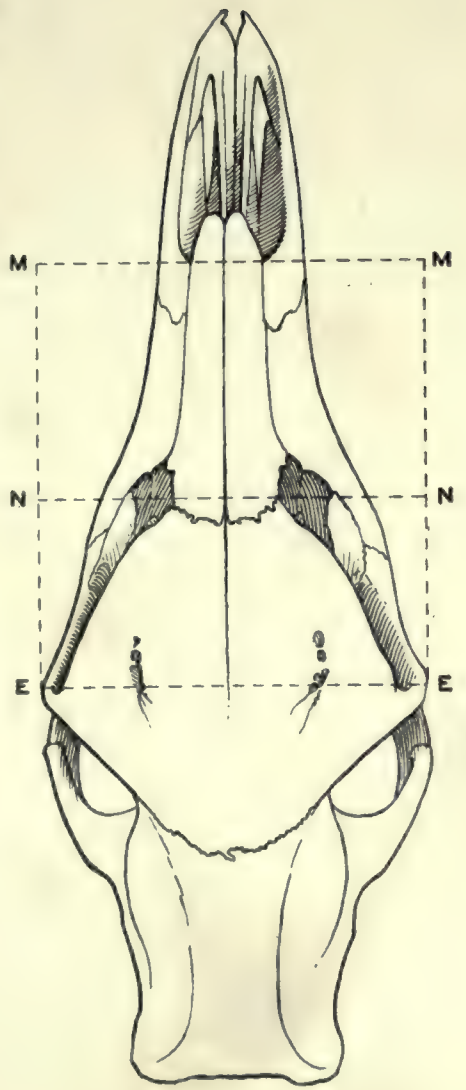
Skull M. University of Rome. No ossicones observed, nor scars for same.

Ratio MM : MN = 150·0 : 100.

PLATE 16.

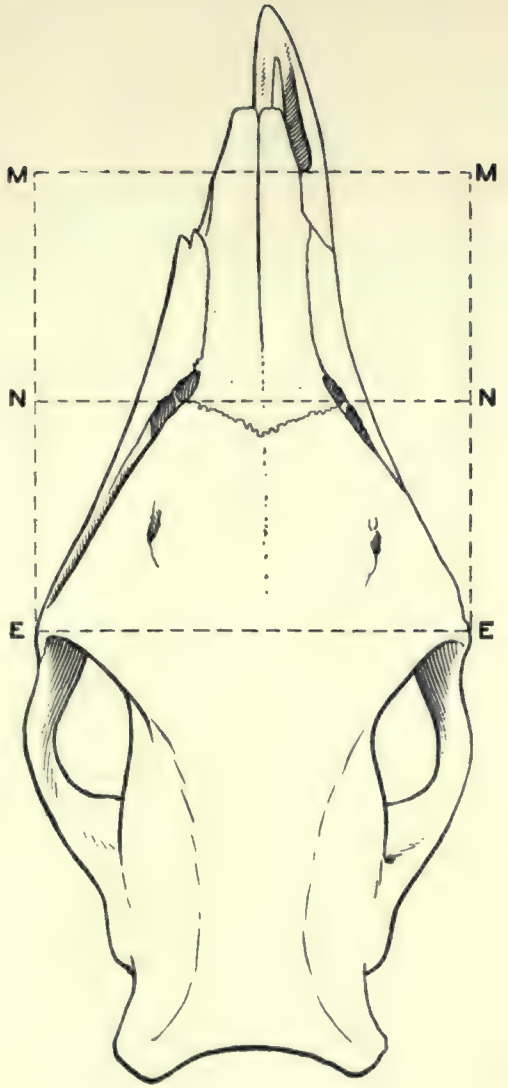
ADLARD & SON, IMPR.

N



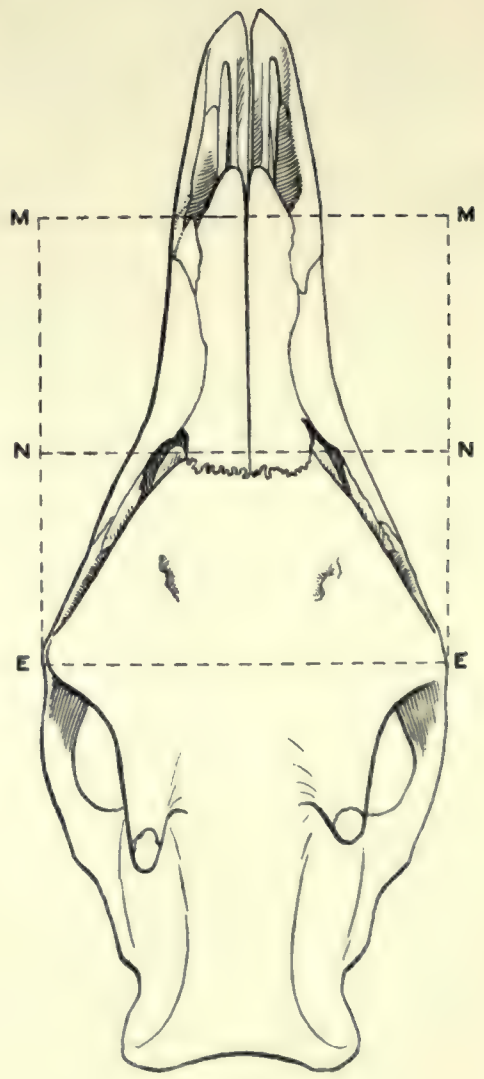
Skull N. Madrid Museum.
No ossicones observed, nor scars for same.
Ratio MM : MN = 166·8 : 100.

O



Skull O. Genoa Museum.
No ossicones observed, nor scars for same.
Ratio MM : MN = 190·4 : 100.

P



Skull P. Paris Museum.

Ratio MM : MN = 174·2 : 100.

PLATE 17.

ADLARD & SON, PRINT.

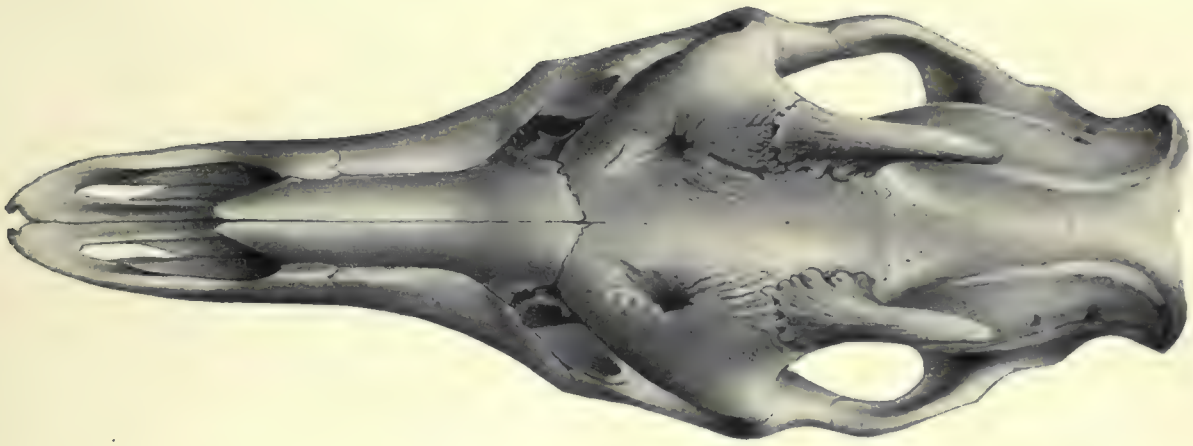


Fig. 1. Skull B ; the skull of the skeleton purchased by the British Museum of Major Powell-Cotton. Dorsal view, one-third natural size, with the ossicones in position. In Plate 3, fig. 2, the skull is drawn with the ossicones removed.

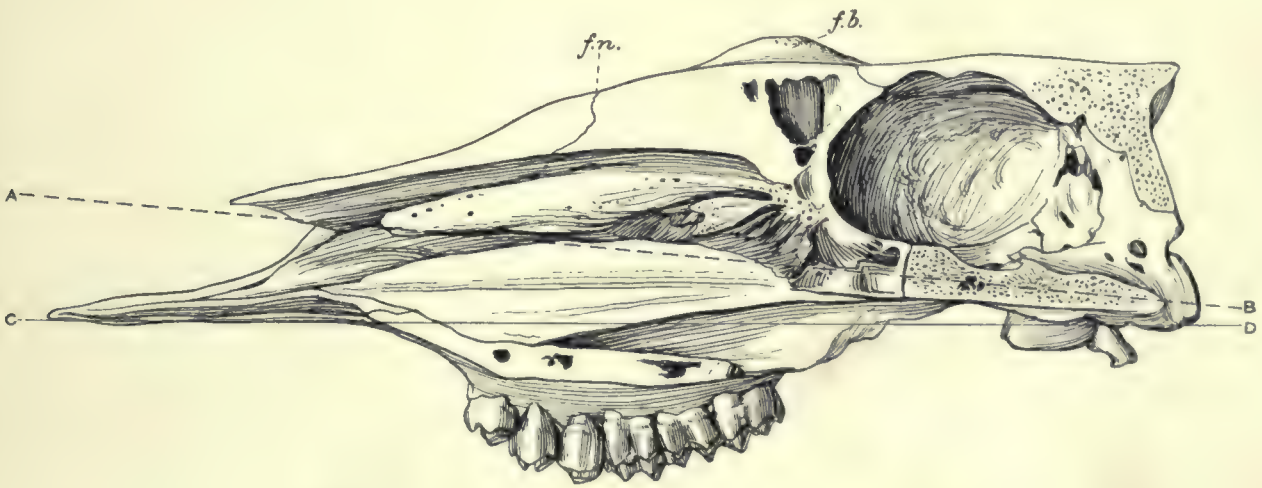


Fig. 2. Skull B ; the skull of the skeleton purchased by the British Museum of Major Powell-Cotton. Sagittal section, one-third natural size.

f.b., frontal boss upon which the ossicone fits ; f.n., fronto-nasal suture ; AB, a line drawn through the basicranial axis ; CD, a line drawn along the palate, from the under side of the premaxilla to the under side of the back of the cranium.

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Explanation of PLATE 19.

PLATE 19.

A series of diagrams showing the angles between the frontal, parietal, and supra-occipital bones, the basicranial axis, and the row of maxillary teeth in the Ox, Elk, Okapi, Elephant, and Man. The diagrams are based upon the inner view of the right half of sagittally bisected skulls, and the thick lines are drawn straight from point to point, disregarding any curve of the bones that may occur between the points. The basicranial axis is set horizontally in each diagram.

A.—The middle of the front end of the presphenoid bone.

B.—The hind edge of the basioccipital bone.

FM.—The superior edge of the foramen magnum.

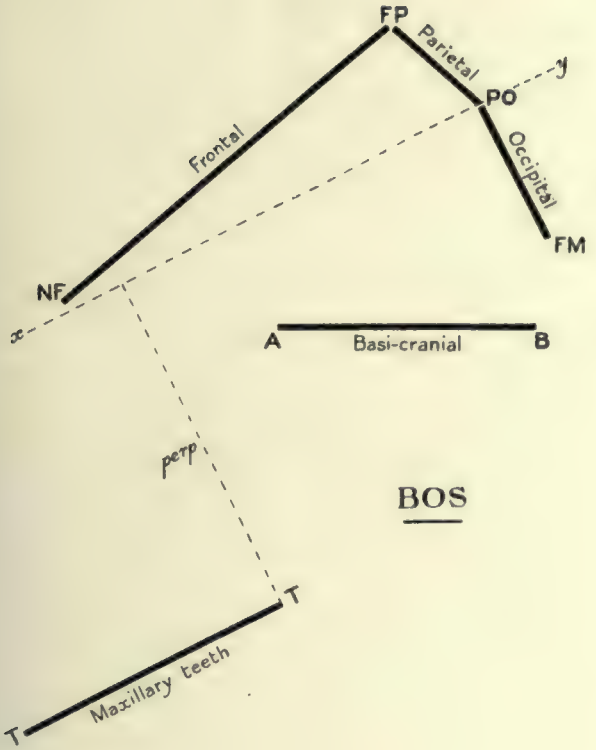
FP.—The suture between the frontal and parietal bones.

NF.—The suture between the nasal and frontal bones.

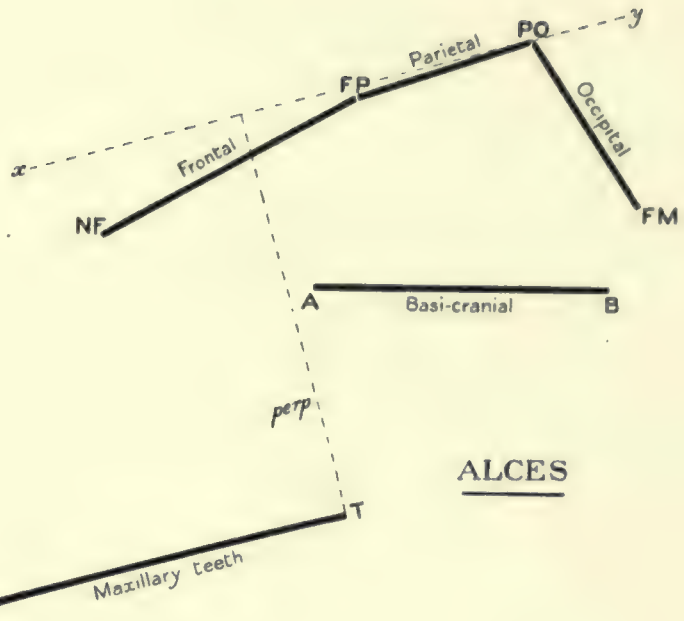
PO.—The suture between the parietal and supraoccipital bones.

TT.—The line of maxillary teeth.

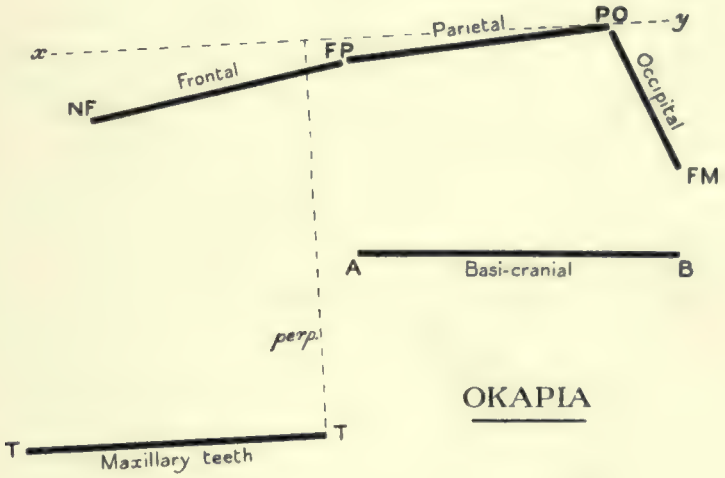
The line *xy* is drawn from the point PO parallel to the line TT, and from the right-hand end of the line TT a perpendicular line (*perp.*) is erected to meet it.



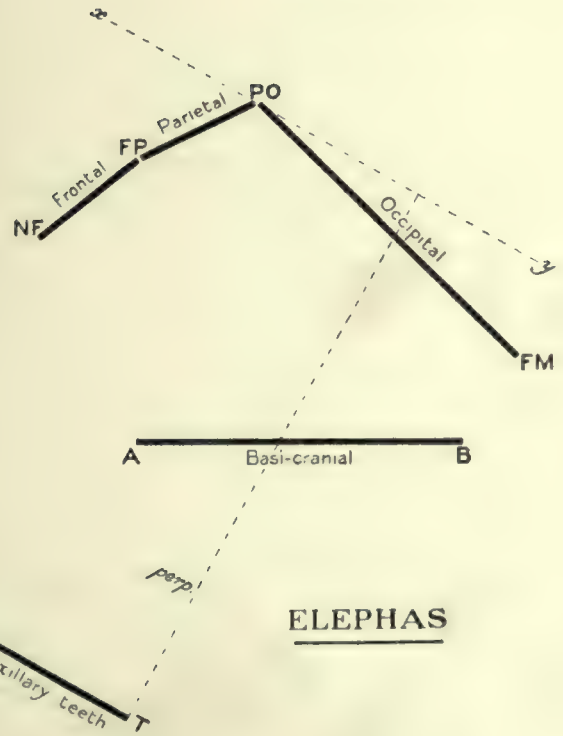
BOS



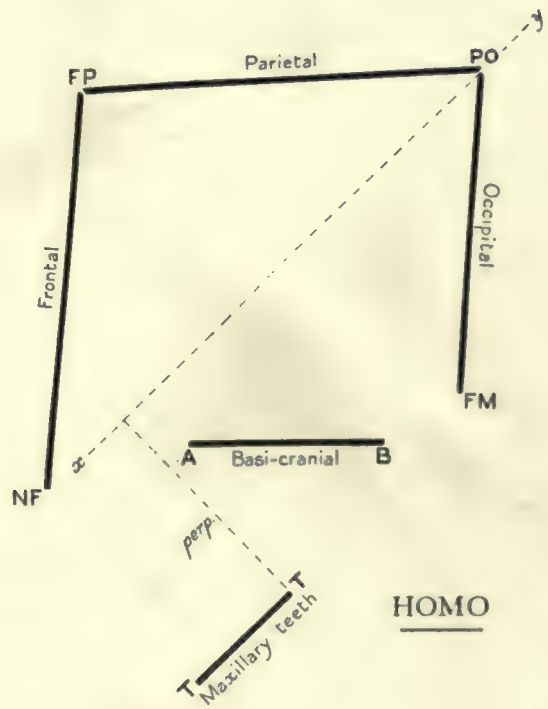
ALCES



OKAPIA



ELEPHAS



HOMO

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Explanation of PLATES 20–22.

PLATES 20—22.

The figures on Plates 20—22 illustrate the differences between the last three cervical and first two dorsal vertebræ in the Okapi (Plate 20), Giraffe (Plate 21), Ox and Camel (Plate 22).

In Ruminants generally, *e. g.* Ox and Camel, the zygapophysial articulations between the seventh cervical vertebra and the first dorsal is of the "lateral" variety, and those between the first and second dorsal vertebræ are of the "median" kind. In the Okapi there are both lateral and median articulations between Cerv. 7 and D. 1, and median articulations between D. 1 and D. 2. In the Giraffe there are lateral articulations between Cerv. 7 and D. 1, and both lateral and median articulations (confluent) between D. 1 and D. 2. See 'Proc. Zool. Soc.,' 1908, pp. 320—334.

Explanation of the Lettering.

C., centrum; *cos.*, articular facet for the tubercular process of the first rib; *c.p.*, articular facet for the head of the second rib; *l.z.a.*, anterior lateral zygapophysis; *l.z.p.*, posterior lateral zygapophysis; *l.z.p.(r.)*, rudimentary posterior lateral zygapophysis; *m.z.a.*, anterior median zygapophysis; *m.z.p.*, posterior median zygapophysis; *neur.*, neural spine; *ti.*, inferior transverse process; *ts.*, superior transverse process; *x.*, hypapophysial tubercle.

OKAPI.

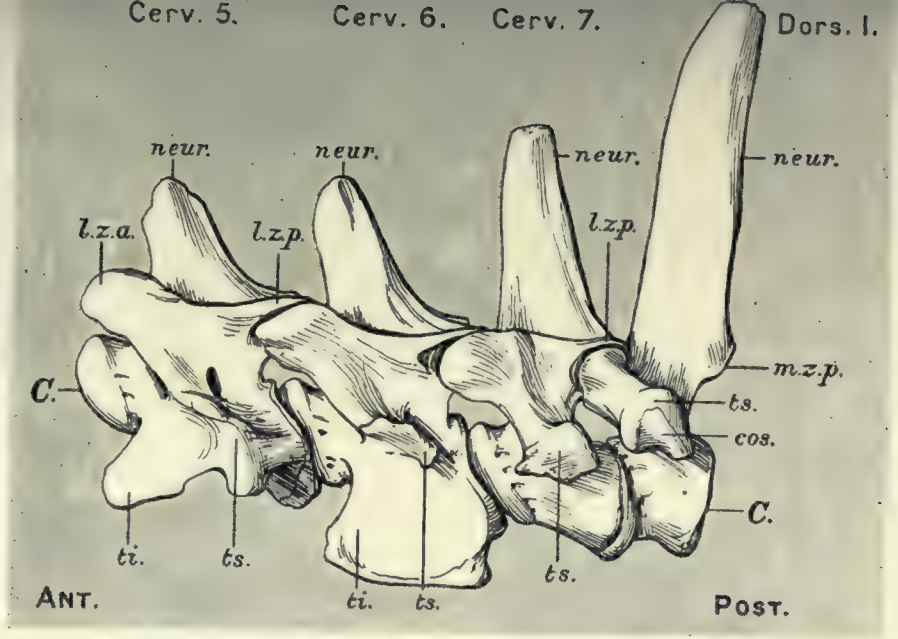


Fig. 1.

Fig. 2.

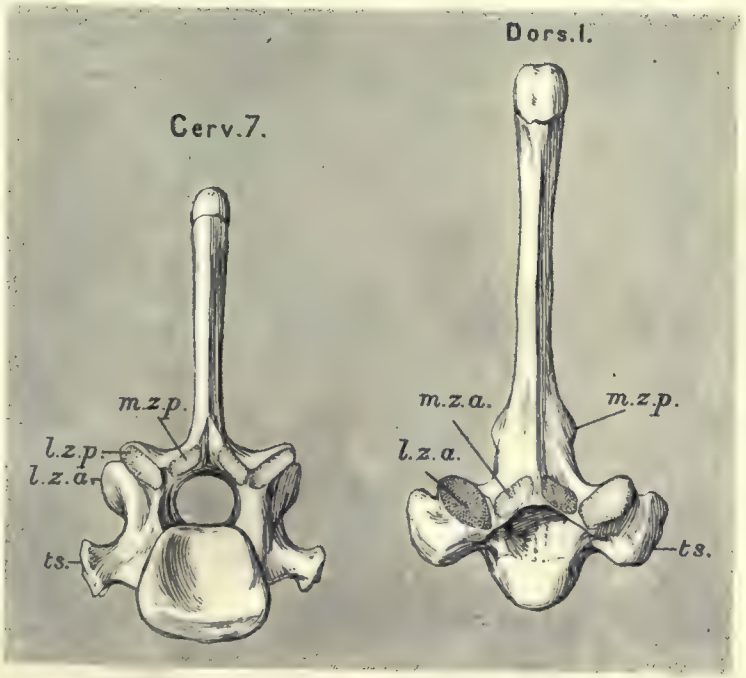
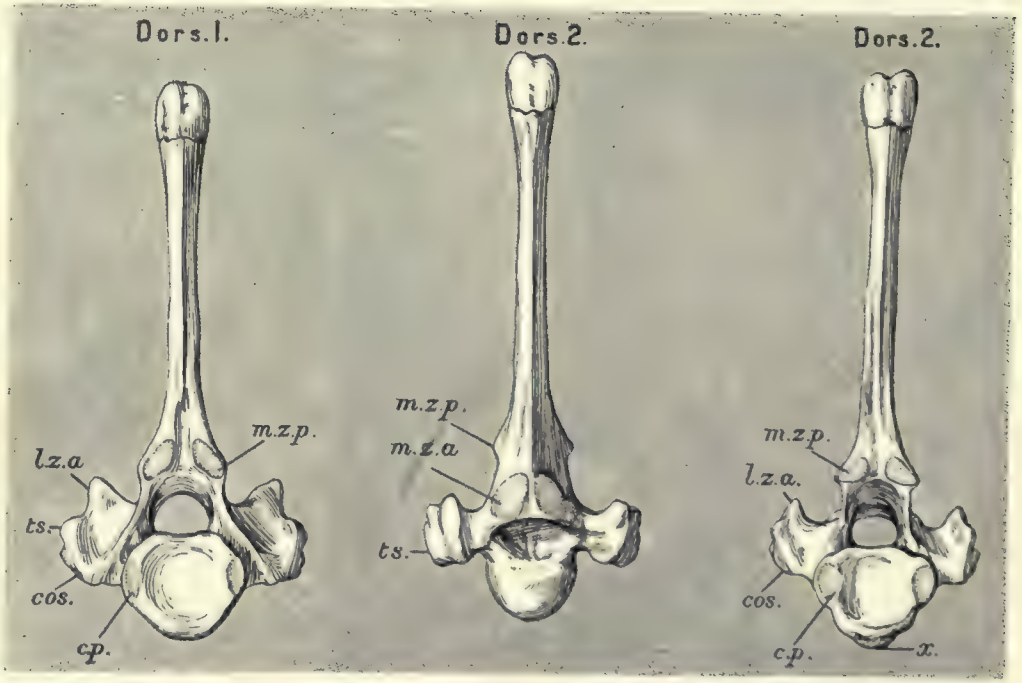


Fig. 3.



The last three Cervical Vertebræ and the first two Dorsal Vertebræ of the Okapi skeleton in the British Museum purchased of Major Powell Cotton. Figures reproduced from 'Proc. Zool. Soc.,' 1908, pp. 322, 326 and 328. Fig. 1, vertebræ Cerv. 5, 6, 7 and D. 1 from the left side. Fig. 2, vertebra Cerv. 7 seen from behind; and D. 1 seen from the front, the vertebra being slightly tilted down to show the zygapophysial facets more clearly. Fig. 3, vertebra D. 1 seen from behind; D. 2 seen from the front, the vertebra being somewhat tilted down; and D. 2 seen from behind. For explanation of the lettering see page opposite.

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GIRAFFE.

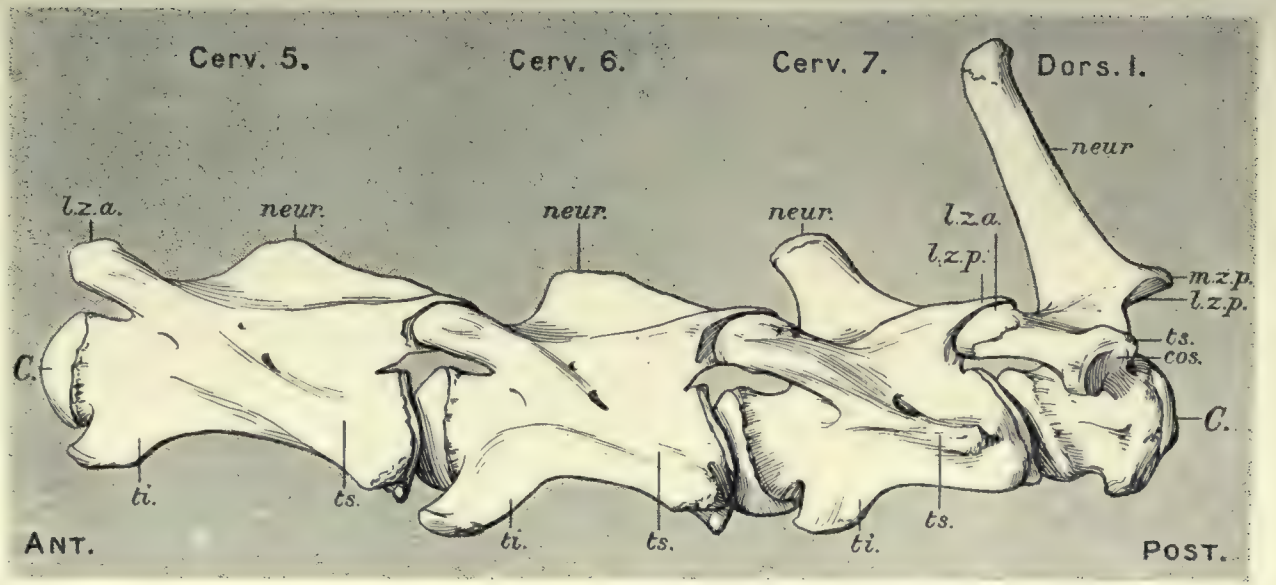


Fig. 1.

Fig. 2.

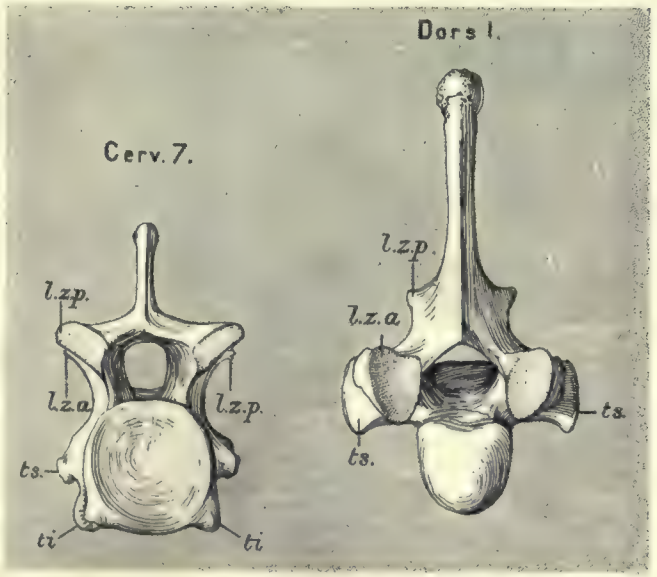
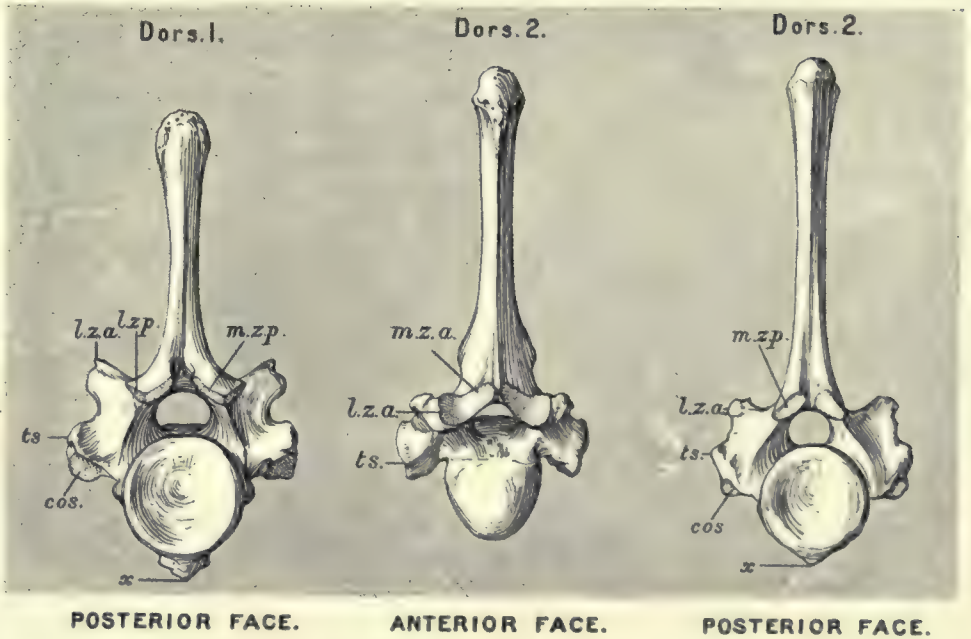


Fig. 3.



The last three Cervical Vertebræ and the first two Dorsal Vertebræ of the Giraffe; skeleton in the British Museum. Figures reproduced from 'Proc. Zool. Soc.,' 1908, pp. 321, 327, and 329. Fig. 1, vertebræ Cerv. 5, 6, 7, and D. 1 from the left side. Fig. 2, vertebra Cerv. 7 seen from behind; and D. 1 seen from the front, the vertebra being slightly tilted down to show the zygapophysial facets more clearly. Fig. 3, vertebra D. 1 seen from behind; D. 2 seen from the front, the vertebra being somewhat tilted down; and D. 2 seen from behind. For explanation of the lettering see page facing Plate 20.

ADLARD & SON, IMPR.

OX.

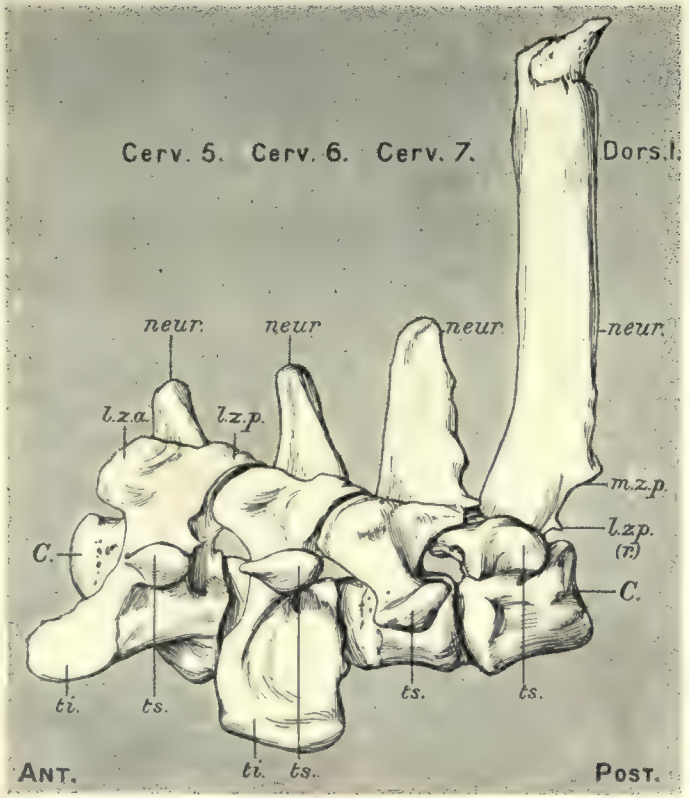


Fig. 1.

CAMEL

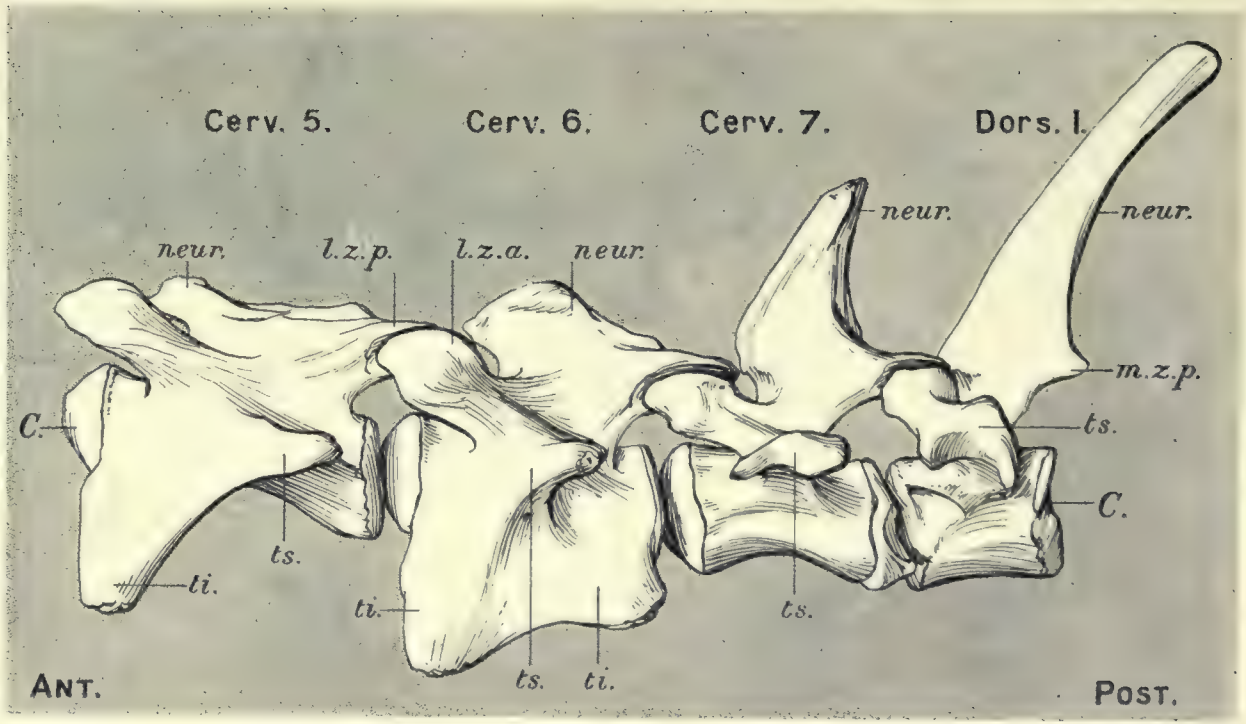


Fig. 2.

The last three Cervical Vertebræ and the first Dorsal Vertebra of the Ox (fig. 1) and Camel (fig. 2) from the left side. Figures reproduced from 'Proc. Zool. Soc.,' 1908, pp. 323 and 325. For explanation of the lettering see page facing Plate 20.

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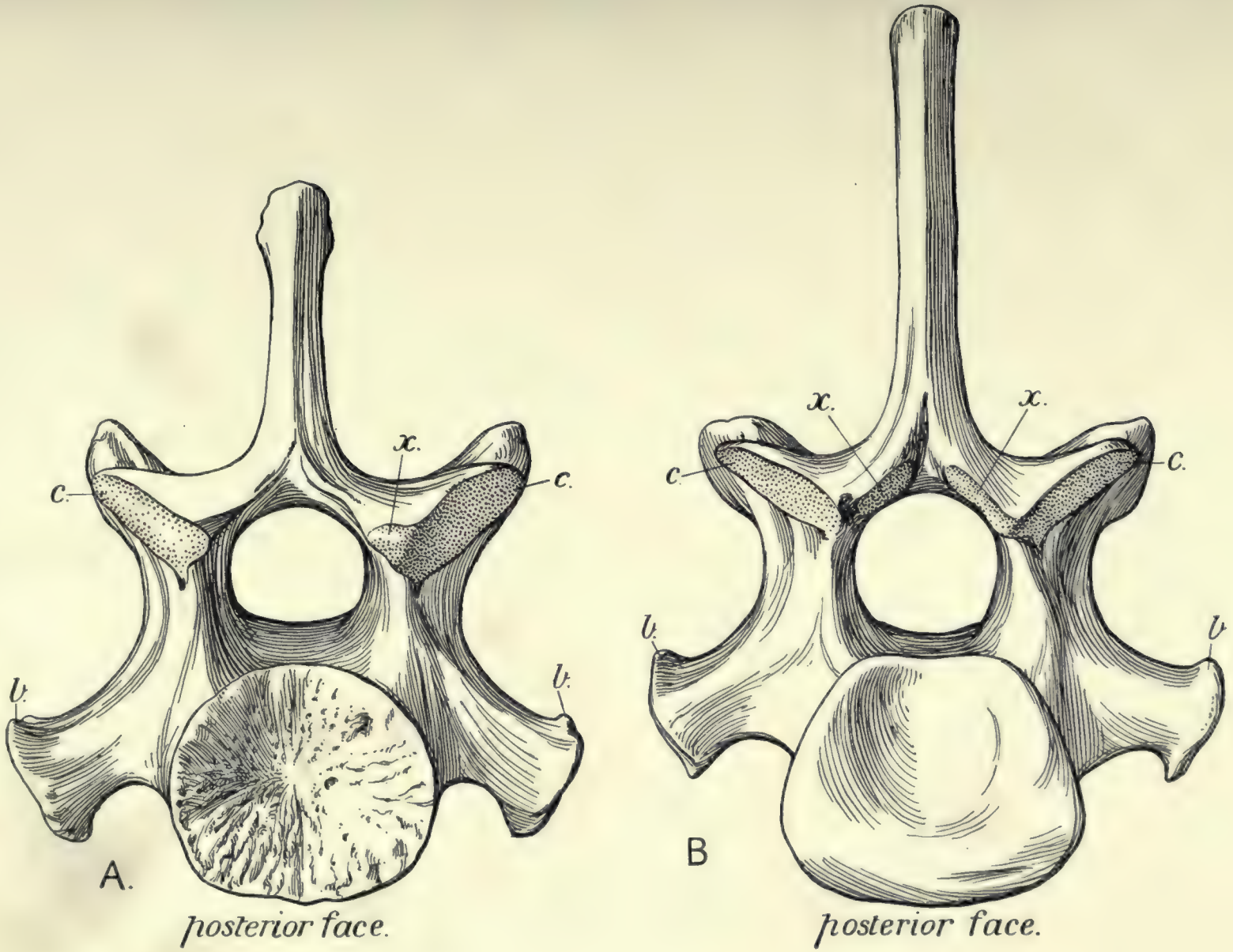
Explanation of PLATES 23–28.

PLATES 23—28.

Plates 23—28 illustrate the differences that exist between the last cervical and first dorsal vertebræ of the Okapi skeleton in the Hon. Walter Rothschild's museum at Tring and those of the skeleton purchased by the British Museum of Major Powell-Cotton. The skull of the former skeleton, Skull F, is figured in Plate 7; that of the latter, Skull B, is figured in Plates 3, 7, 9 and 18.

The drawings of the vertebræ are of the natural size. In some respects the former vertebræ are larger than those of the British Museum skeleton, although from a younger, and on the whole a smaller animal. See 'Proc. Zool. Soc.,' 1908, p. 330. The posterior epiphysis of the seventh cervical vertebra of Mr. Rothschild's Okapi skeleton is wanting (Plates 23, A; 24, A; 25, A), as also is the anterior epiphysis of the first dorsal vertebra (Plates 26, A; 27, A; 28, A).



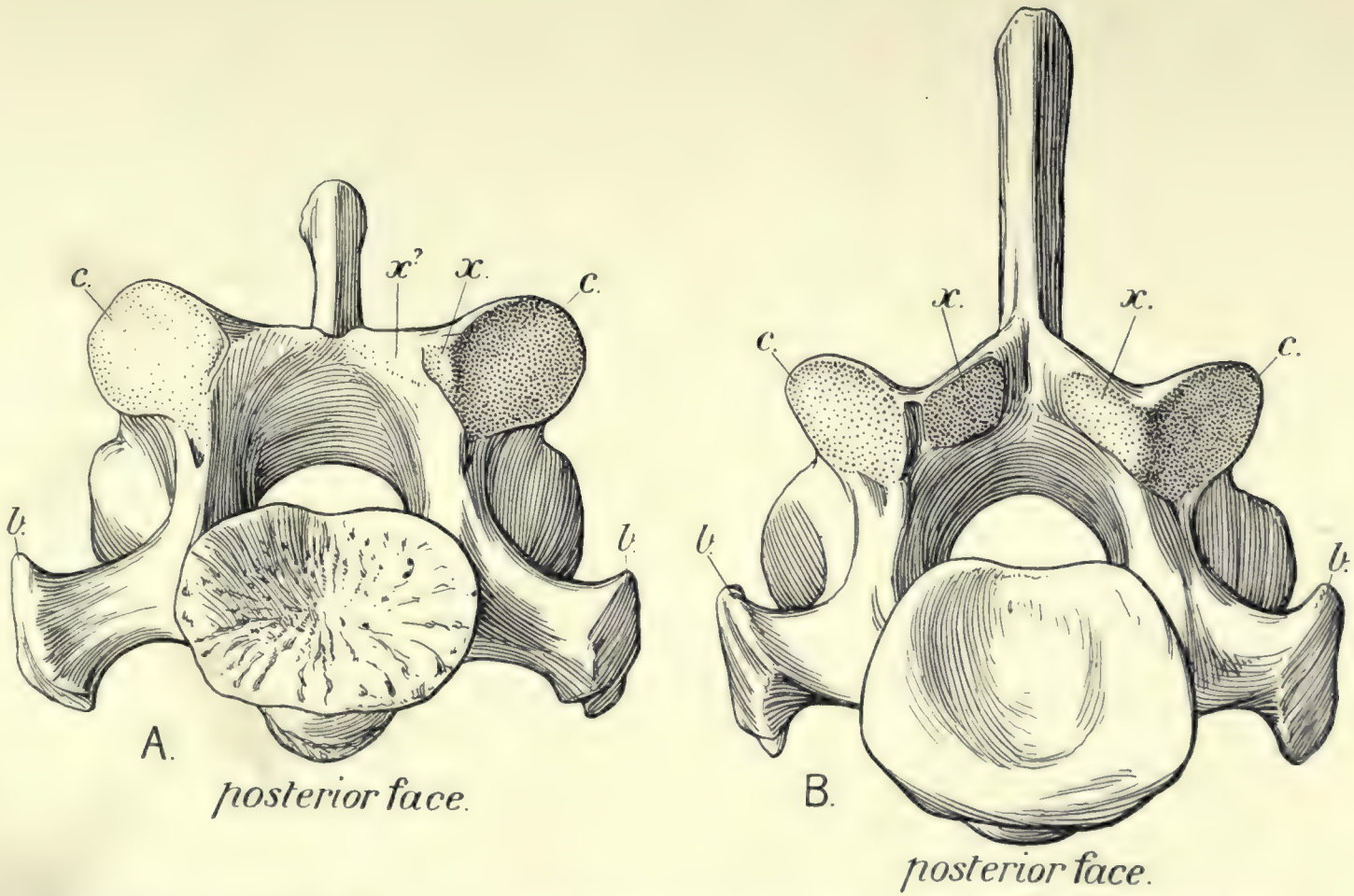
Seventh Cervical Vertebra of Okapi, posterior view.

A.—From skeleton in the Hon. Walter Rothschild's museum at Tring.

B.—From skeleton purchased by the British Museum of Major Powell-Cotton.

b, transverse process; c, lateral zygapophysial facet; x, median zygapophysial facet, almost wanting in A.

ADLARD & SON, IMPR.



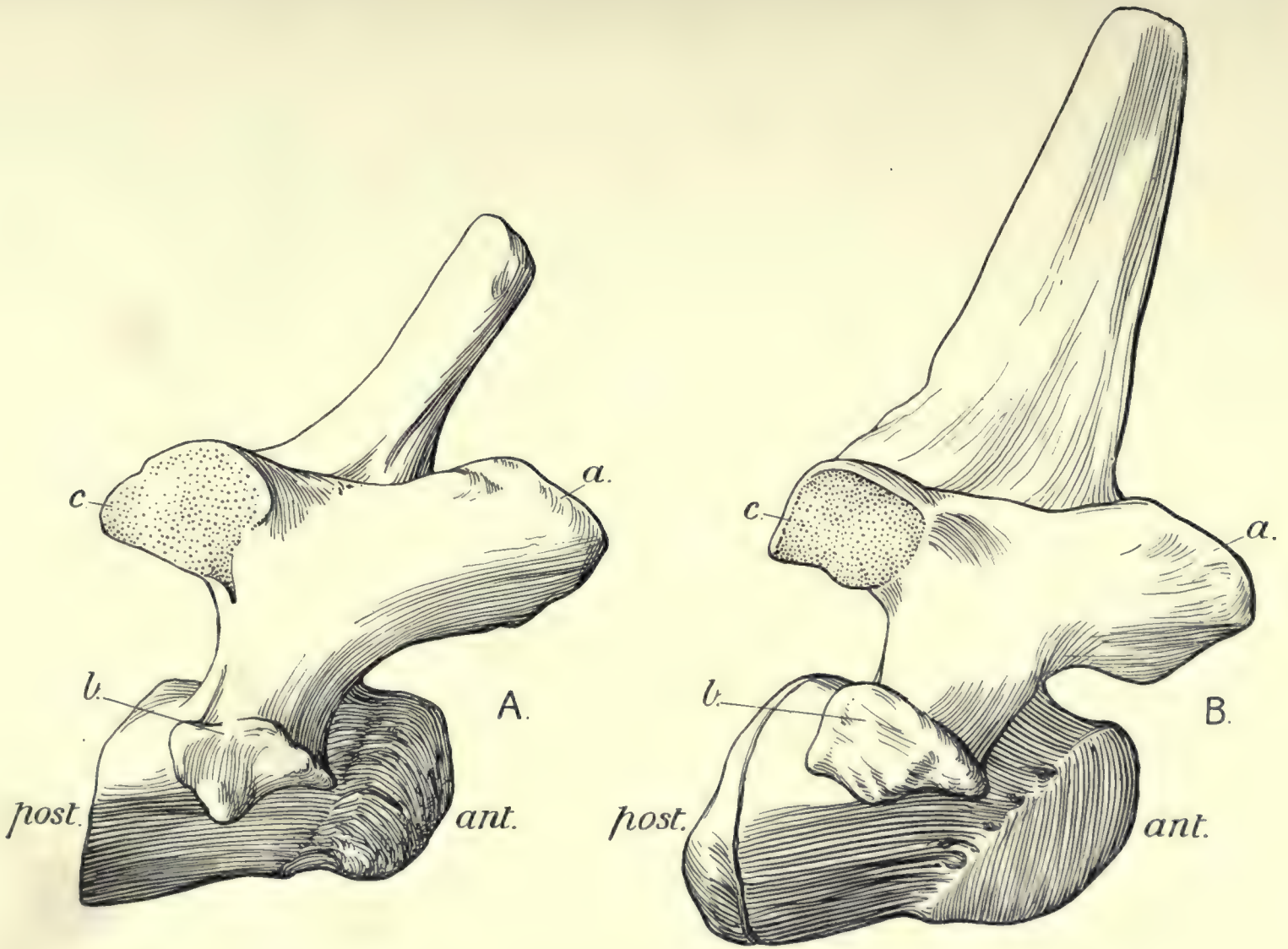
Seventh Cervical Vertebra of Okapi, slightly tilted up so as to show more clearly the zygapophysial facets; posterior view.

A.—From skeleton in the Hon. Walter Rothschild's museum at Tring.

B.—From skeleton purchased by the British Museum of Major Powell-Cotton.

b, transverse process; c, lateral zygapophysial facet; x, median zygapophysial facet, almost wanting in A.

ADLARD & SON, IMPR.



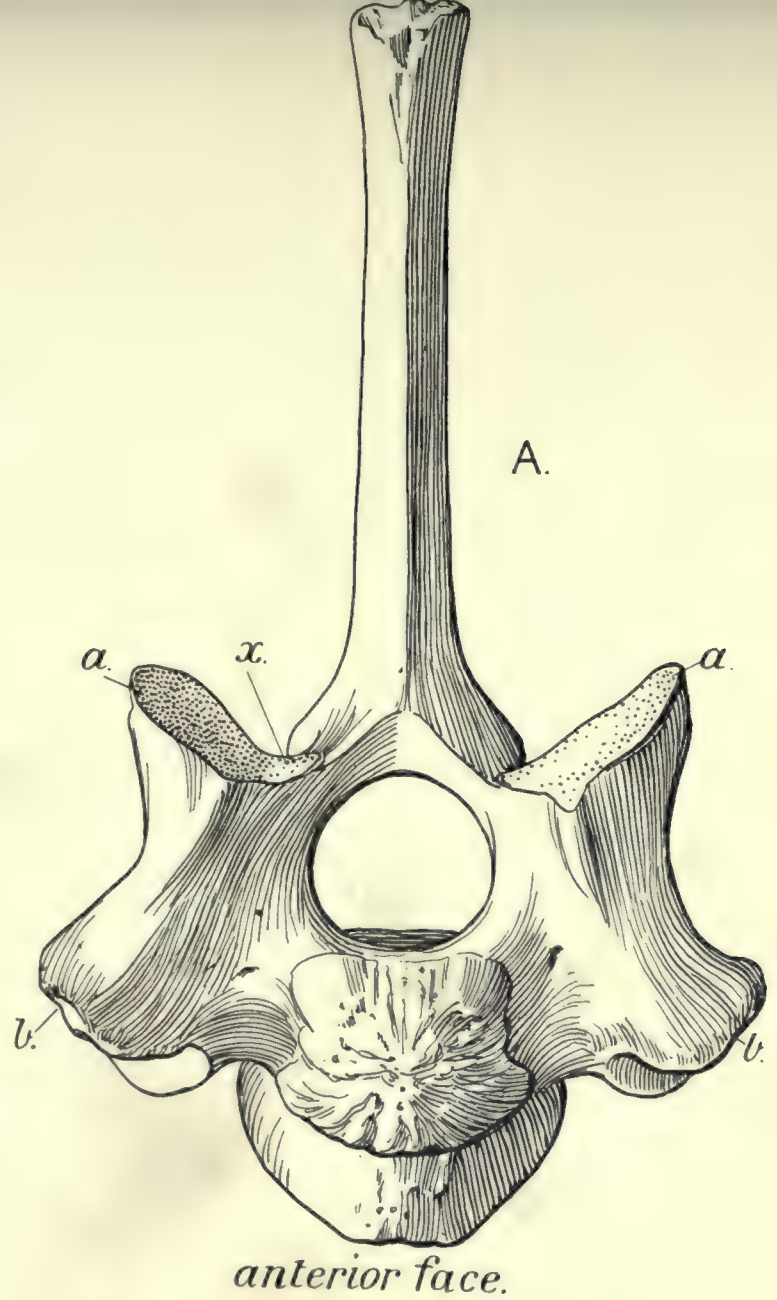
Seventh Cervical Vertebra of Okapi, right side.

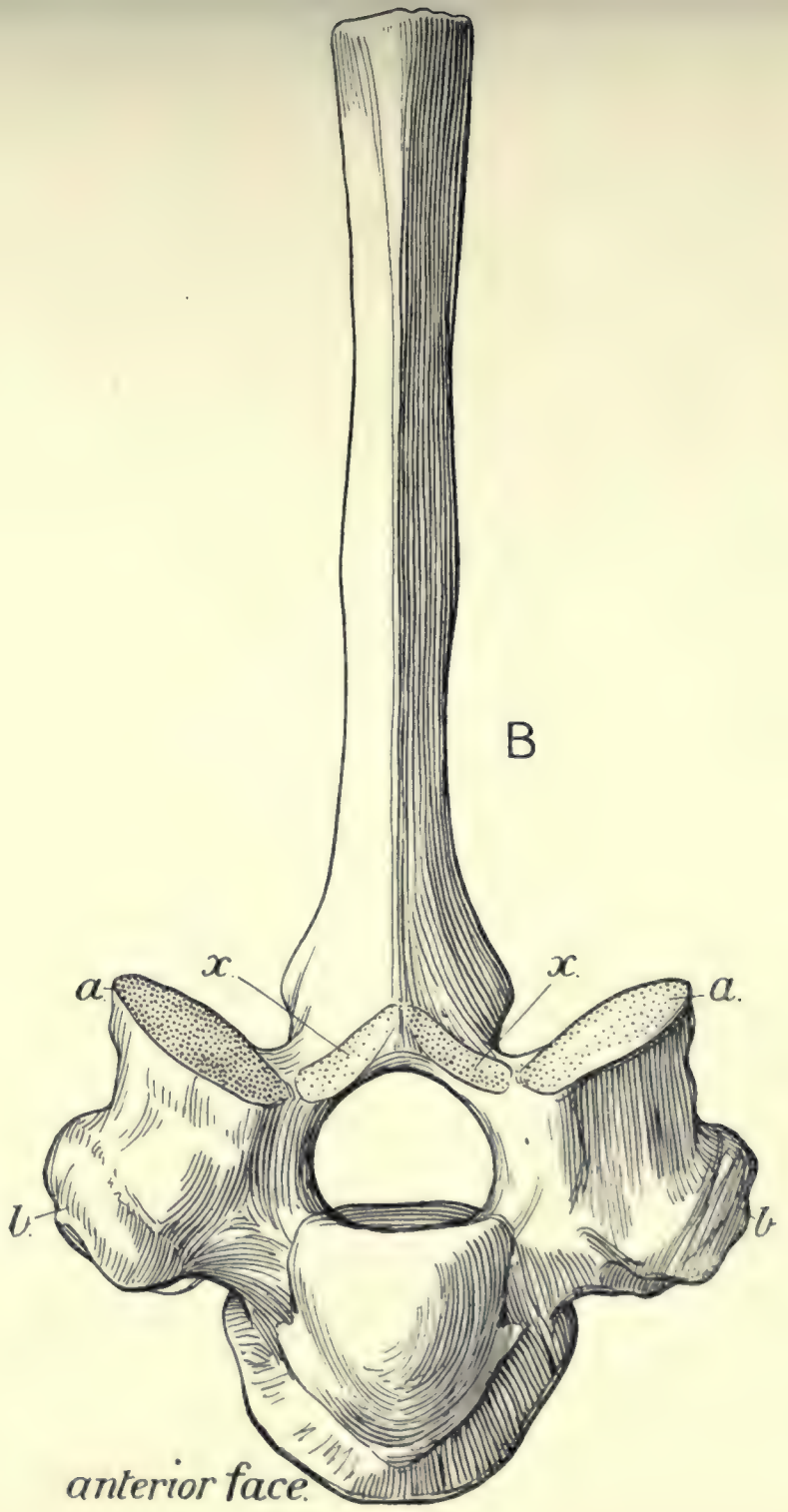
A.—From skeleton in the Hon. Walter Rothschild's museum at Tring.

B.—From skeleton purchased by the British Museum of Major Powell-Cotton.

a, anterior zygapophysis; b, transverse process; c, articular facet of the lateral posterior zygapophysis.

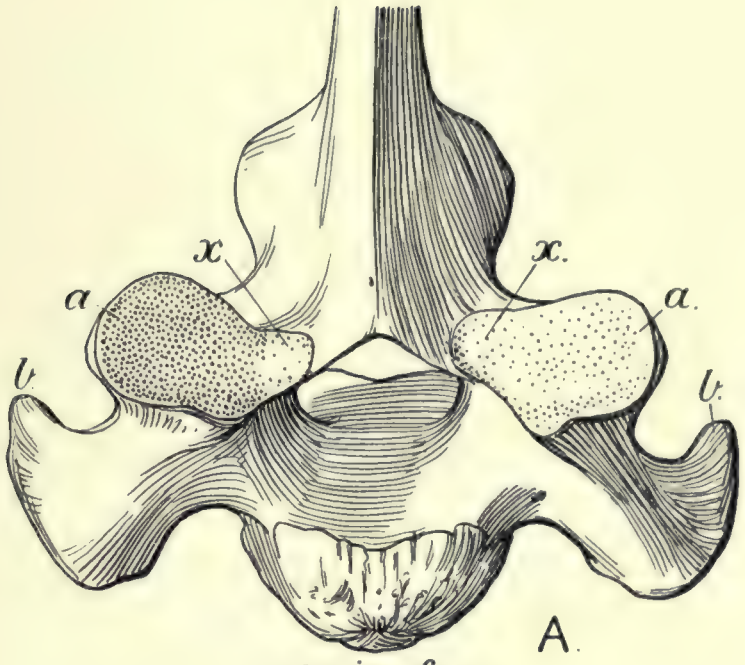
ADLARD & SON, PRINT.



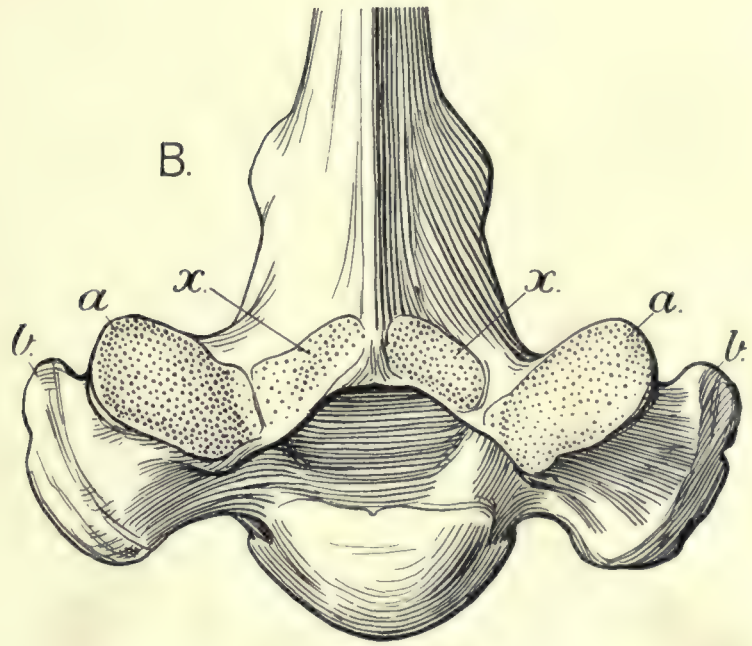


First Dorsal Vertebra of Okapi, anterior view.
A.—From skeleton in the Hon. Walter Rothschild's museum at Tring.
B.—From skeleton purchased by the British Museum of Major Powell-Cotton.
a, lateral zygapophysial facet; b, transverse process; x, median zygapophysial facet, almost wanting in A.

ADLARD & SON, IMPR.



anterior face.



anterior face.

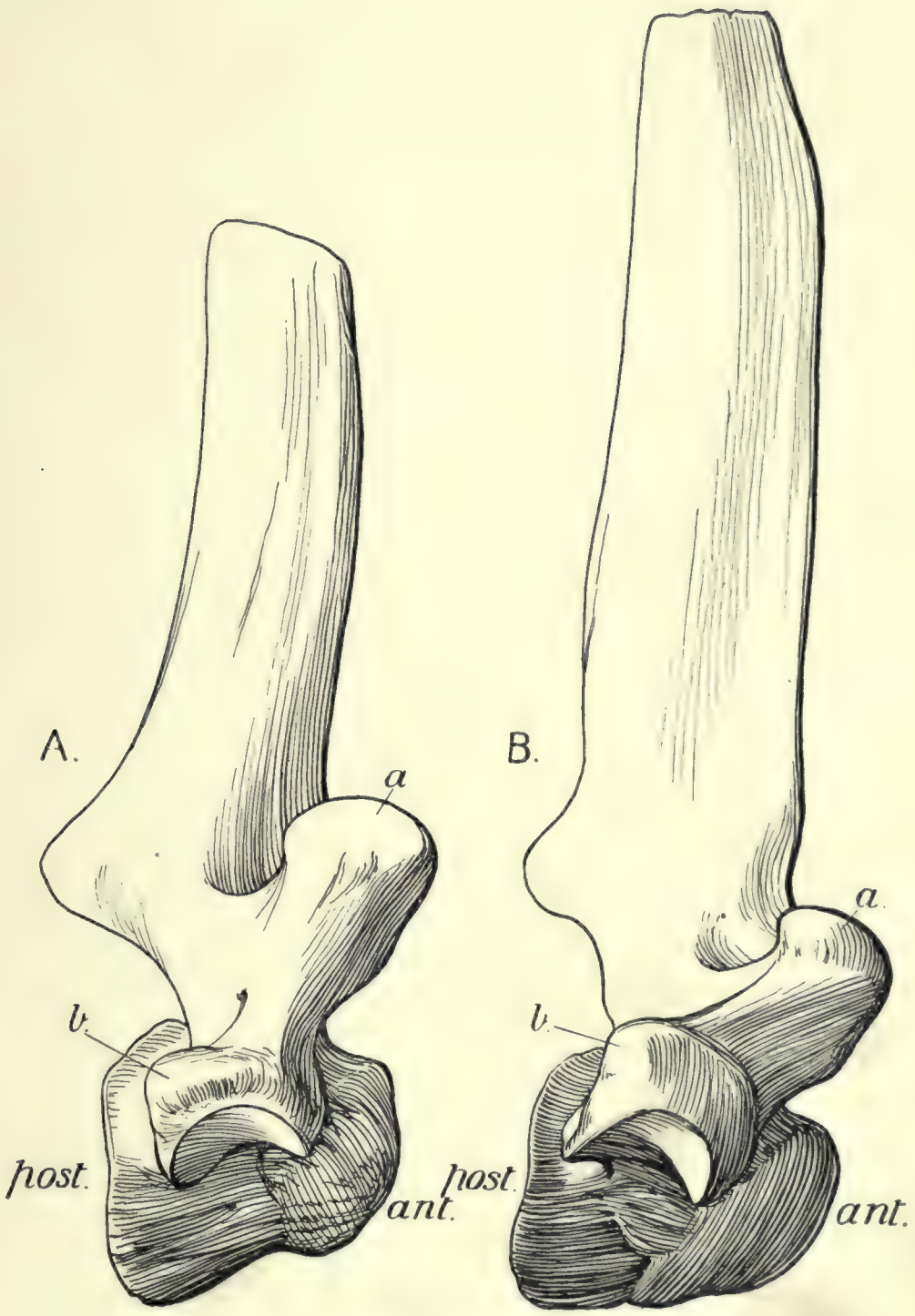
First Dorsal Vertebra of Okapi, slightly tilted down so as to show more clearly the zygapophysial facets, anterior view.

A.—From skeleton in the Hon. Walter Rothschild's museum at Tring.

B.—From skeleton purchased by the British Museum of Major Powell-Cotton.

a, lateral zygapophysial facet; b, transverse process; x, median zygapophysial facet, almost wanting in A.

ADLARD & SON, IMPR.



First Dorsal Vertebra of Okapi, right side.

A.—From skeleton in the Hon. Walter Rothschild's museum at Tring.

B.—From skeleton purchased by the British Museum of Major Powell-Cotton.

a, anterior zygapophysis; b, transverse process.

ADLARD & SON, IMPR.

Explanation of PLATES 29–40.

PLATES 29—40.

The figures in Plates 29—40 have been prepared with a view to facilitating a comparative study of the leg-stripes of the Okapis mounted in the various museums of Europe. In some cases, as, for instance, in the specimen presented to the British Museum by Sir Harry Johnston (Plate 29), each leg of the animal is shown in three views, making twelve figures in all. The sequence of the figures is the same in each set of six, and where it has not been possible to obtain any particular views of the legs, spaces are left in the series, as, for instance, in Plate 39.

Plates 29—31.—Three specimens at the British Museum.
Plate 32.—Two specimens mounted by Mr. Rowland Ward.
Plate 33.—Specimens at Rome and Edinburgh.
Plate 34.—Specimens at Genoa and Madrid.
Plate 35.—Specimens at Paris, Tervueren, and Madrid.
Plate 36.—Living Okapi calf.
Plate 37.—Two specimens at Tervueren.
Plate 38.—Specimens at Lisbon and Tervueren.
Plate 39.—Specimens at Stockholm and Antwerp.
Plate 40.—Specimens at Tring and Carlsruhe.

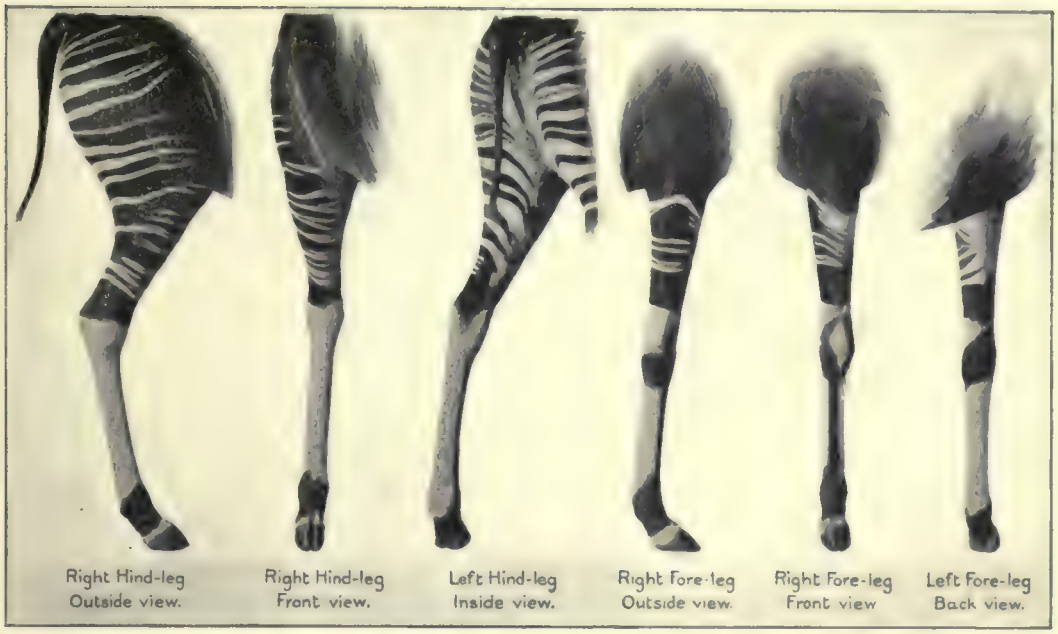


Fig. 1. Specimen in the British Museum (Natural History) presented by Sir Harry Johnston. For the hind leg see also Plate 1, fig. 1. The skull of this animal is that denoted A in Plates 3, 8 and 13.

Fig. 2. Same specimen as above. For a figure of the whole animal see Plate 44, fig. 1.

ADLARD & SON, IMPR.

Fig. 1. Specimen in the British Museum (Natural History) presented by Major Powell-Cotton. For the hind leg see also Plate 1, fig. 2. The skull of this animal is that denoted B in Plates 3, 7, 9, 13 and 18.

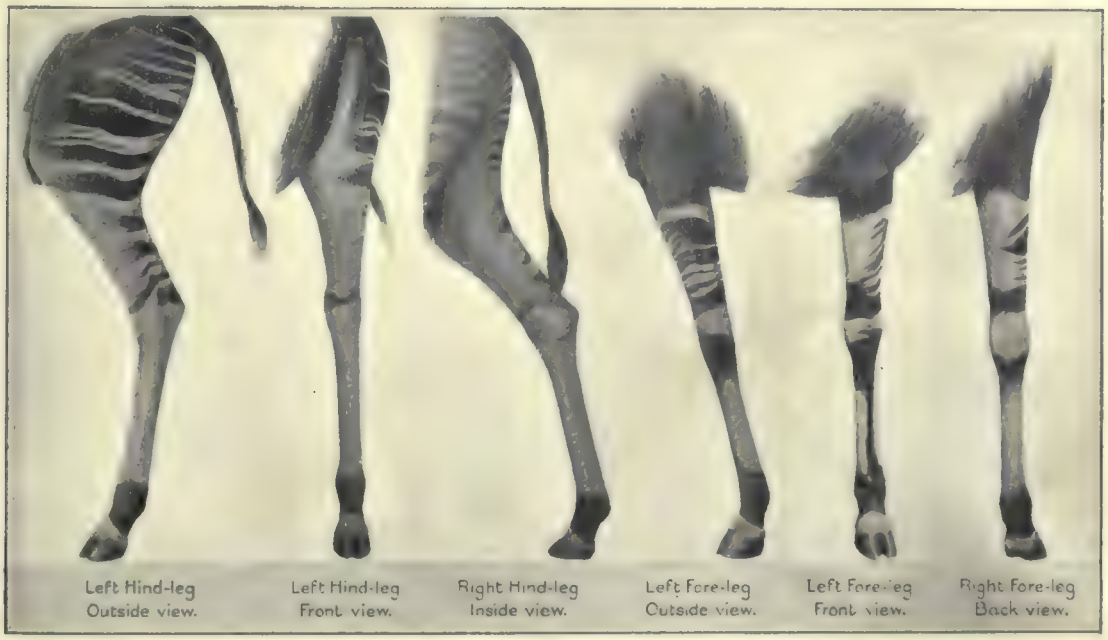


Fig. 2. Same specimen as above. For a figure of the whole animal see Plate 45, fig. 1.

ADLARD & SON, IMPR.

Fig. 1. Specimen in the British Museum (Natural History) presented by the late Mr. Boyd Alexander. For a figure of the whole animal see Plate 44, fig. 2. The skull of this animal is that denoted D in Plates 4, 5, 6, 11 and 14.

Fig. 2. Same specimen as above.

ADLARD & SON, IMPR

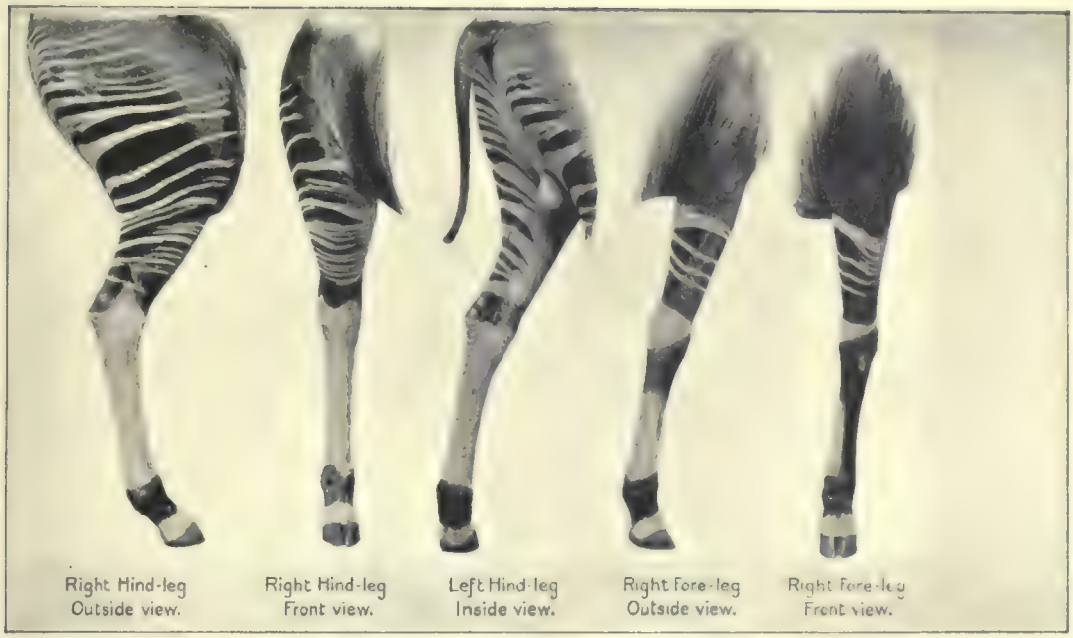


Fig. 1. Specimen mounted by Mr. Rowland Ward, London (No. 1 Specimen), and now in America. Sex doubtful; the animal is mounted as though male. From photographs supplied by Mr. Rowland Ward. The skull of this animal is that denoted C in Plates 4, 8 and 13.

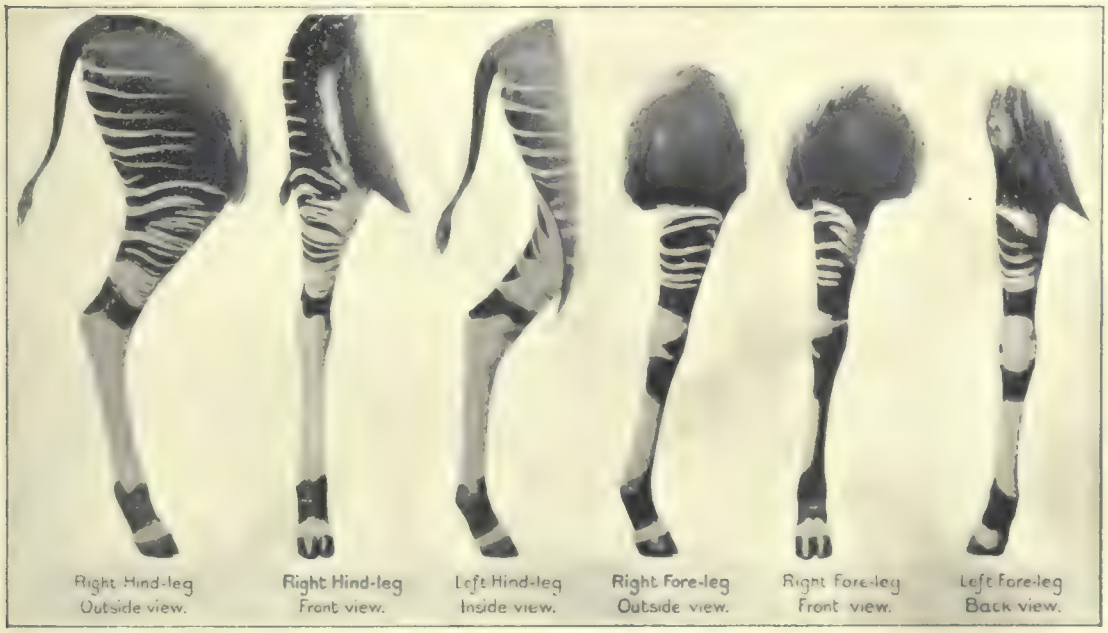


Fig. 2. Another specimen mounted by Mr. Rowland Ward, London (No. 3 Specimen). From photographs supplied by Mr. Rowland Ward.

ADLARD & SON, IMPR.

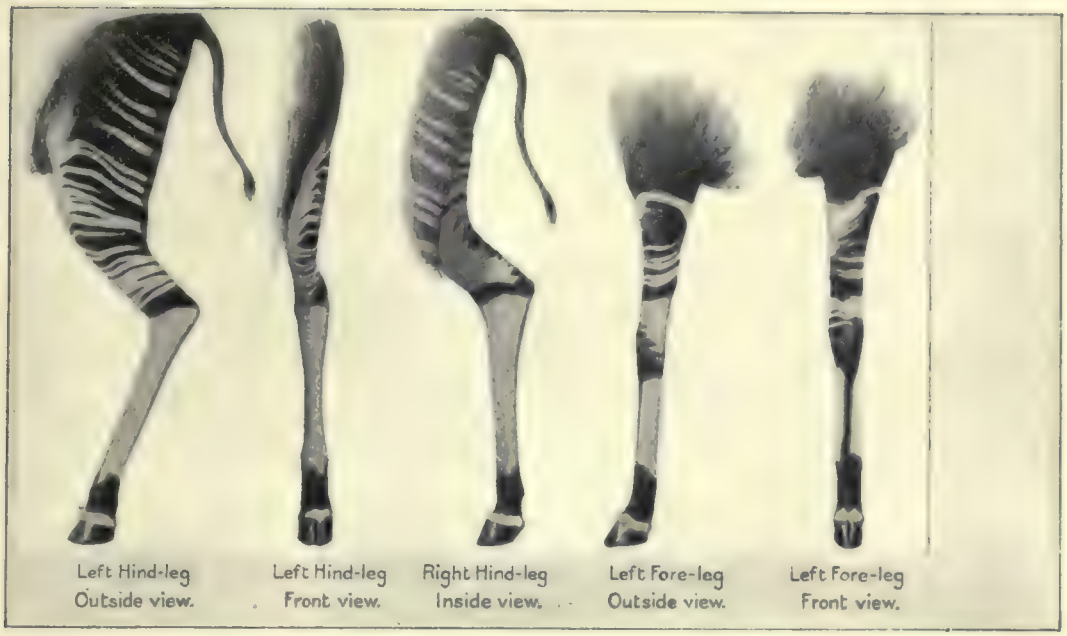


Fig. 1. Specimen in the Museum of the University of Rome; from photographs supplied by the University of Rome. A figure of the whole animal is given by J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 14, fig. 6, No. 488), and an earlier one by A. Carruccio ('Boll. Soc. Zool. Ital.,' ser. 2, vol. iv, 1903; the plate is apparently published in the third part of his paper in vol. vi, 1905). Skull M in Plate 16 is not the skull of this animal (see Fraipont, p. 14, pars. 5 and 6).

Fig. 2. Specimen in the Royal Scottish Museum, Edinburgh; from photographs supplied by Mr. W. Eagle Clarke. Sex doubtful; the animal is mounted as though male. For a figure of the whole animal see Plate 45, fig. 2. The skull of this animal is that denoted G in Plates 12 and 15.

ADLARD & SON, IMPR.

Fig. 1. Specimen in the Genoa Museum (Museo Civico di Storia Naturale); from photographs supplied by the Genoa Museum. A figure of the whole animal is given by J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 15, fig. 9; the specimen is mentioned in paragraph 25 on page 15). Skull O in Plate 17 is hornless, and is evidently not the skull of this animal.

Fig. 2. Specimen in the Madrid Museum; from photographs supplied by the Madrid Museum. Half-grown, reputed male; No. 705a of J. Fraipont. A figure of the whole animal is given by J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 14, fig. 7). For a back view see Plate 35, fig. 3. Skull N in Plate 17 is hornless, and is evidently not the skull of this animal.

ADLARD & SON, IMPR.

Fig. 1. Specimen in the Paris Museum (Muséum d'Histoire Naturelle); from photographs supplied by the Paris Museum; adult, said to be male, No. 503 of J. Fraipont. A figure of the whole animal is given by J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 13, fig. 5). A front view is given by M. de Rothschild and H. Neuville ('Ann. Sci. Nat., Zool.,' ser. 9, vol. x, No. 1, 1909 [February, 1910], p. 6, fig. 1). Skull P in Plates 2 and 17 is not the skull of this animal (see Fraipont, p. 14, paragr. 7 and 9).

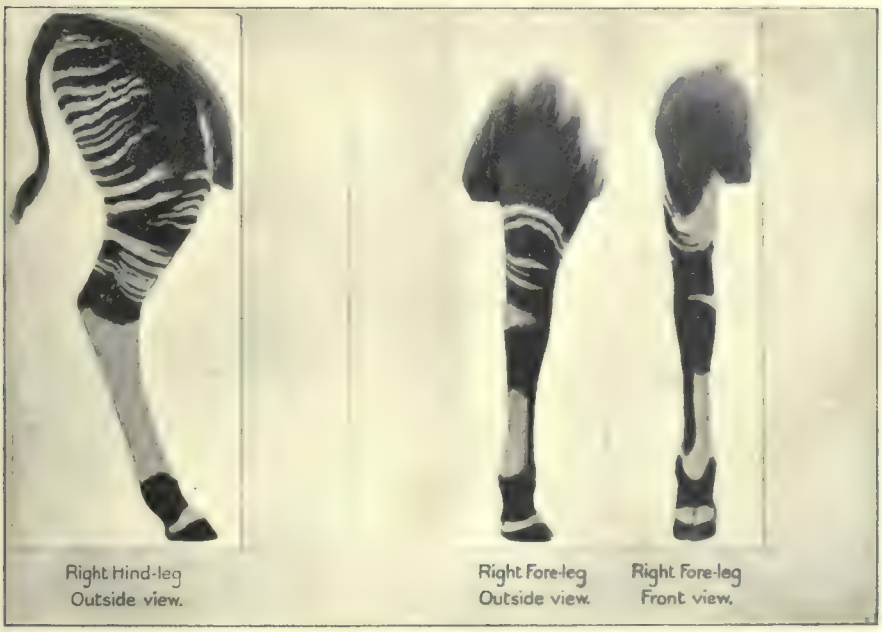


Fig. 2. Specimen in the Tervueren Museum (Musée du Congo), Belgium; very young, No. 706; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 31, fig. 41, and p. 26, fig. 29 .

Fig. 3. Specimen in the Madrid Museum; hind view; from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 30, fig. 38).

ADLARD & SON, IMPR.

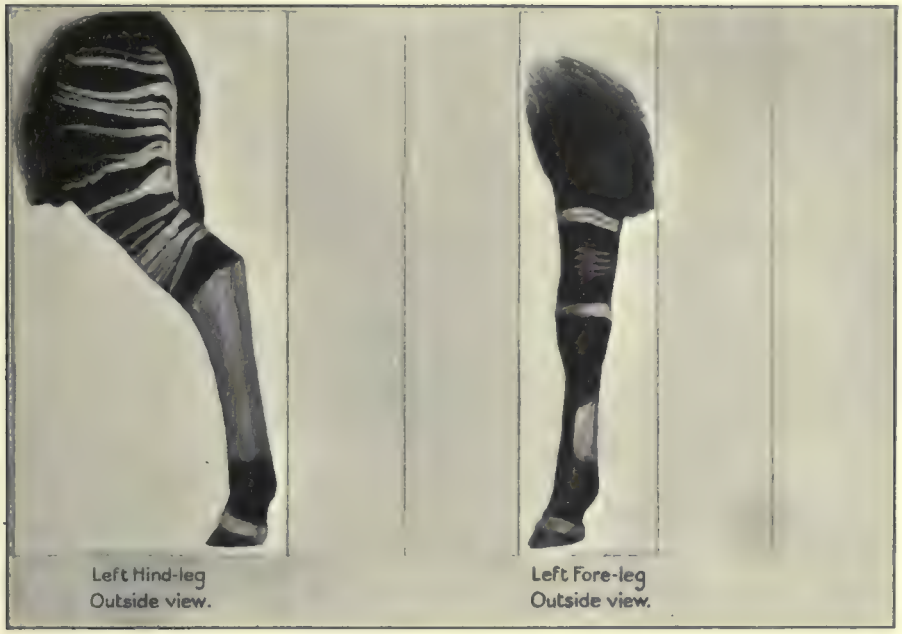


Fig. 1. Specimen of a living Okapi calf, one month old; from a photograph taken by Monsieur Ribotti at Bambili and sent to Sir Ray Lankester by the Marquis Giacomo Doria, of the Genoa Museum. For a figure of the whole animal see Plate 46, fig. 1.

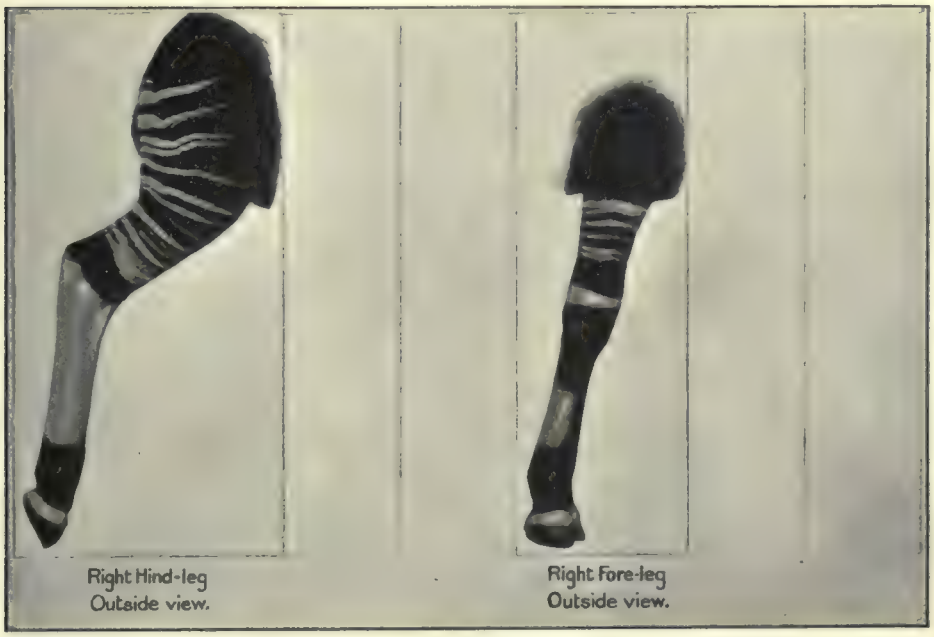


Fig. 2. Same specimen as above.

ADLARD & SON, IMPR

Fig. 1. Specimen in the Tervueren Museum (Musée du Congo), Belgium; young, said to be female; No. 541; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 18, fig. 11, and p. 25, fig. 28).

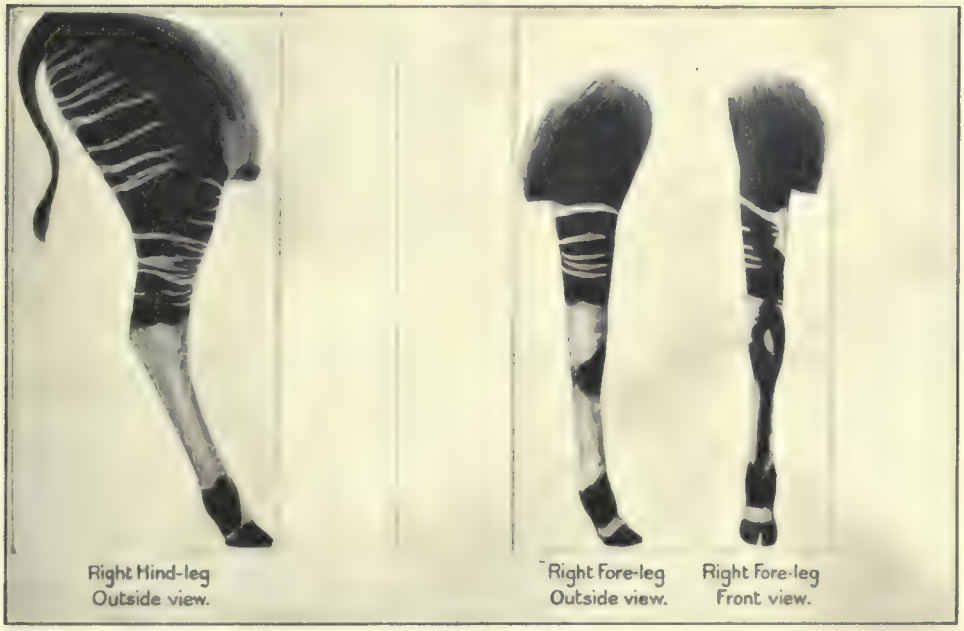


Fig. 2. Specimen in the Tervueren Museum (Musée du Congo), Belgium; old, said to be female; No. 536; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 23, fig. 22, and p. 24, fig. 25). The skull of this animal is that denoted N in Plate 17 (see Fraipont, p. 14, paragr. 10).

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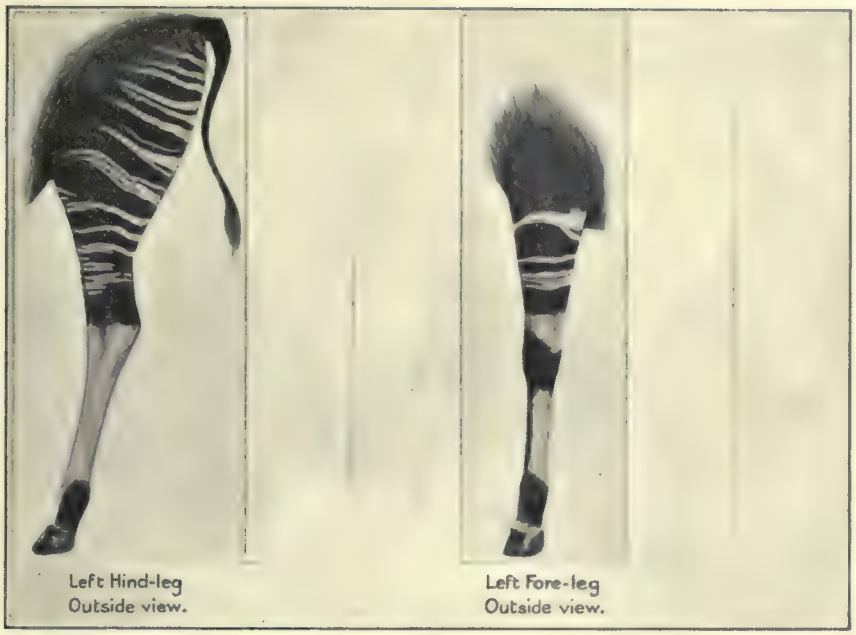

Fig. 1 Specimen in the Lisbon Museum; adult, said to be female, No. 484 of J. Fraipont; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 12, fig. 4).

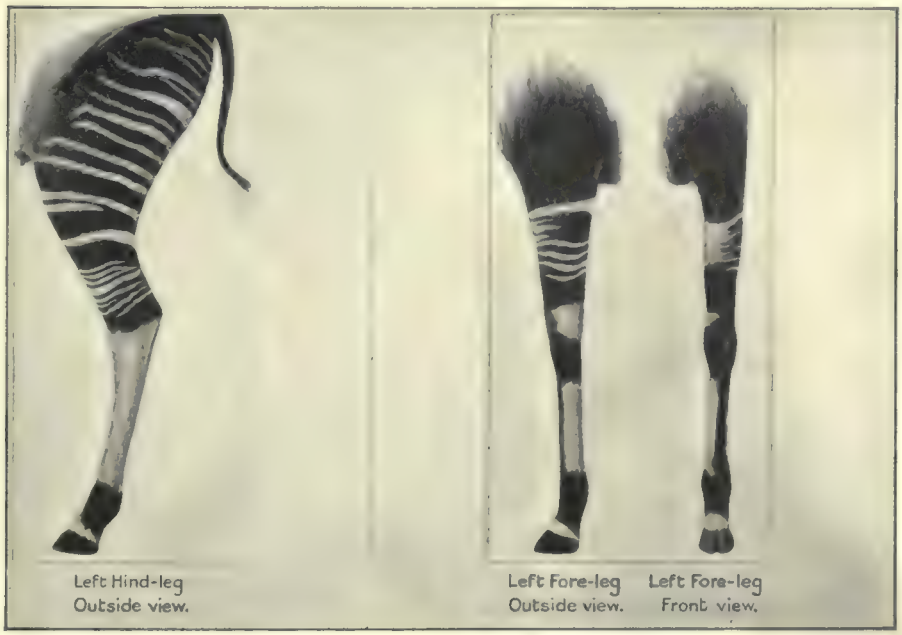

Fig. 2. Specimen in the Tervueren Museum (Musée du Congo), Belgium; adult, said to be male, No. 534; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 17, fig. 10, and p. 25, fig. 26). The skull of this animal is that denoted P in Plate 17.

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Fig. 1. Specimen in the Stockholm Museum ; half-grown, said to be male, No. 479 of J. Fraipont ; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 11, fig. 3). This skin is the paratype of Okapia liebrechtsi, *Major, described in 'La Belgique Coloniale,' viii, No. 45, November 9th, 1902, p. 533, but mentioned in 'Proc. Zool. Soc.,' 1902, ii, p. 73, published in October, 1902. Dr. Forsyth Major at the time considered the sex to be female. The type specimen of the species is the skull of an older Okapi, No. 480 of Frapiont. See remarks on Skull L in the pages preceding Plate 13.*

Fig. 2. Specimen in the Antwerp Museum (Société Royale de Zoologie) ; adult, said to be male, No. 532 of J. Fraipont ; figures copied from J. Fraipont ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," 1907, p. 15, fig. 8, and p. 24, fig. 24). A figure of this specimen was published in 1904 by L. F. de Pauw ('Ann. Soc. Roy. Zool. Malacol. Belg.,' 1904, p. clxiv). The corresponding skeleton is mounted in the Antwerp Museum, and is figured by Fraipont (l.c., plate xvi).

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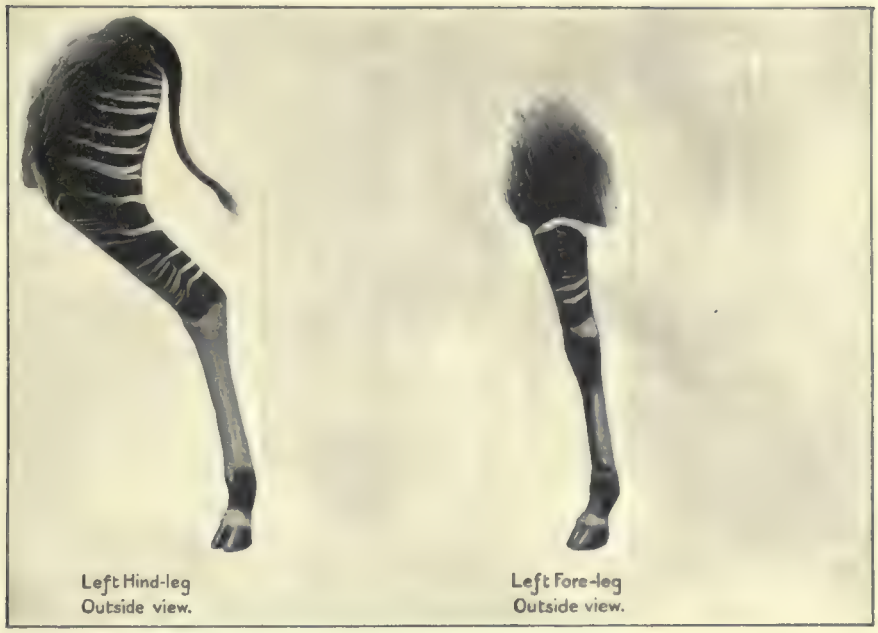

Fig. 1. Specimen in the Hon. Walter Rothschild's museum at Tring; from a photograph supplied by Mr. Rothschild. For a figure of the whole animal see Plate 46, fig. 2. The skull of this specimen is that denoted F in Plates 7 and 14.

Fig. 2. Specimen in the Museum of Carlsruhe, Baden; from photographs supplied by the Carlsruhe Museum.

ADLARD & SON, IMPR.

Explanation of PLATES 41, 42, and 43 (fig. 1).

PLATES 41, 42, AND 43 (FIG. 1).

A series of thirty-three bandoliers cut by natives from Okapi skin, chiefly from the striped region of the hind leg. Lent by Major Powell-Cotton. [A pair of similar bandoliers sent by Sir Harry Johnston to Dr. P. L. Sclater in 1900, and figured by him in the 'Proceedings of the Zoological Society,' 1901, i, p. 51, are reproduced in colour in Plate 1. These bandoliers are the two co-types of *Equus* (?) *johnstoni*, Sclater, a name subsequently altered to *Okapia johnstoni* by Lankester ('Proc. Zool. Soc.,' 1901, ii, p. 281).]

The rule to the left of the figures is marked in inches and feet on the left-hand edge and in centimetres on the right.

PLATE 41.

Fig. 1.—Bandoliers A—H. The collector's labels for A—E read "Congo, Kangi, No. 3, Male, hind leg." F is marked "Congo, Kangi, young, from Kasindi, 18.8.05." G and H, "Congo, Kangi, young, same beast, sent off 16.9.06."

Fig. 2.—Bandoliers I—N. I bears collector's label "Congo, Kangi, No. 5, by Majura, Mawambe-Auskube." J, "Fort Portal, 28.10.05, Ouex, 27.12.05, 277, Congo, Kangi, No. 5, by Majura." I and J arrived tied together, with a common label "two bits from same beast, one other bit, label lost." K and L are similarly marked "same beast"; also M and N. K, "Congo, Kangi, No. 1, female, buttock." L, "Congo, Kangi, No. 1, female, hind leg." M and N, "Congo, Kangi, Mawambe-Auskube, four bits by Lenda, these two pieces almost fit."

PLATE 42.

Fig. 1.—Bandoliers O—V. O and P bear collector's label, "Congo, Kangi, from Kasindi, 18.8.06, these two join." Q, R and S, "Congo, Kangi, sent off 16.9.06, probably the same beast." T, U and V, "Congo, Kangi, six of these three bits, one belongs to No. 3, and one to No. 5.

Fig. 2.—Bandoliers W—Cc. W, X, Y and Cc bear similar labels, "Congo, Kangi, No. 3, male, fore-leg," and Aa, "Congo, Kangi, No. 3, male." Attached to W is a label, "Ten pieces of a male Okapi (all same beast). There is one other bit, but label lost. Some of these probably fit together." Although the label is attached to W only, it probably applies also to A, B, C, D, E, X, Y, Aa and Cc, all of which, with W, are marked "Kangi, No. 3, male"; possibly it applies also to either T, U or V, one of which is said to belong to No. 3. This, of course, makes more than the "ten pieces." Z, "Congo, Kangi, No. 2, female, buttock, no other bit of skin of this beast." Bb, "Congo, Kangi, four bits by Lenda, Mawambe-Auskube"; two other of the "four bits by Lenda' are evidently M and N.

PLATE 43.

Fig. 1.—Bandoliers Dd—Gg. These bear the name "Powell-Cotton"; and in addition Ee bears the label "Strip from fore-leg." No other particulars are available.

Fig. 1. Bandoliers of Okapi skin, lent by Major Powell-Cotton.

Fig. 2. Bandoliers of Okapi skin, lent by Major Powell-Cotton.

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Fig. 1. Bandoliers of Okapi skin, lent by Major Powell-Cotton.

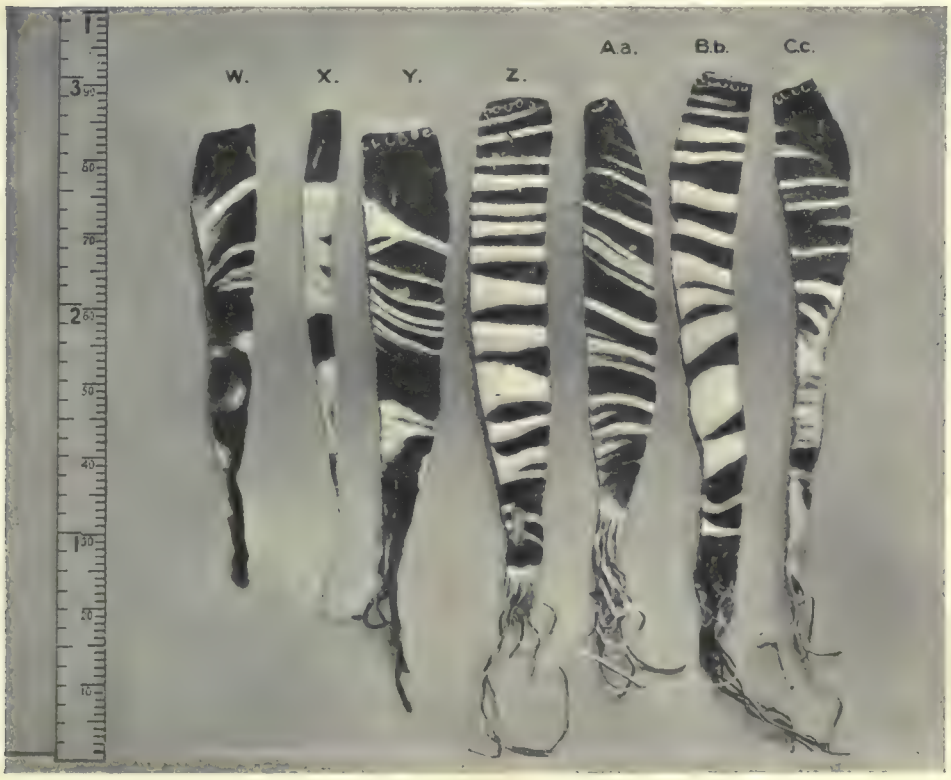

Fig. 2. Bandoliers of Okapi skin, lent by Major Powell-Cotton.

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Fig. 1. Bandoliers of Okapi skin, lent by Major Powell-Cotton.

Fig. 2. Head of the specimen in the British Museum (Natural History) presented by the late Mr. Boyd Alexander, 1907. Young male. Locality: Welle River, near the northern border of the Congo Free State. For a side view of the whole animal see Plate 44, fig. 2.

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Fig. 1. Specimen in the British Museum (Natural History) presented by Sir Harry Johnston, 1901, who obtained it from Lieutenant Eriksson of the Congo Free State Administration. Sub-adult, sex doubtful. Locality: Semliki Forest, near Lake Albert Edward. A description of this specimen is given in E. Ray Lankester's paper on "Okapia" ('Trans. Zool. Soc.,' 1902, vol. xvi, part vi, pp. 279—314). This skin, with the corresponding skull (Skull A in Plates 3, 8 and 13), is the type of Okapia erikssoni, *Lankester ('Ann. Mag. Nat. Hist.,' ser. vii, x, 59, November, 1902, p. 417).*

Fig. 2. Specimen in the British Museum (Natural History) presented by the late Mr. Boyd Alexander, 1907. Young male. Locality: Welle River, near the northern border of the Congo Free State. The head of this specimen is shown also in Plate 43, fig. 2. The skull is that denoted D in Plates 4, 5, 6, 11 and 14.

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Fig. 1. Specimen in the British Museum (Natural History) presented by Major Powell-Cotton, 1906. Young male. Locality: Ituri Forest, Makala, East Central Africa. From a photograph lent by Major Powell Cotton. The skull of this specimen is that denoted B in Plates 3, 7, 9, 13 and 18; the hinder neck vertebræ are figured in Plates 20, 23—28.

Fig. 2. Specimen in the Royal Scottish Museum, Edinburgh. Adult, sex doubtful. Locality: Ituri Forest. From a photograph supplied by Mr. W. Eagle Clarke. The skull of this specimen is that denoted G in Plates 12 and 15.

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Fig. 1. Photograph of a living Okapi calf, one month old, taken by Monsieur Ribotti, at Bambili on the Welle River, and sent to Sir Ray Lankester by the Marquis Giacomo Doria, of the Genoa Museum. The photograph was shown at the meeting of the British Association at Leicester on August 5th, 1907, and was reproduced in the 'Illustrated London News' in the issue of September 7th, 1907. The photograph is published also in J. Fraipont's monograph ('Annales du Musée du Congo, Zool.,' ser. 2, vol. i, "Okapia," October, 1907, p. 96, fig. 77), where it is stated to have been taken by Monsieur Lamboray at Angu, Rubi.

Fig. 2. Specimen in the Hon. Walter Rothschild's museum at Tring. Young, sex doubtful. Locality unknown. From a photograph supplied by Mr. Rothschild. The skull of this animal is that denoted F in Plates 7 and 14; the last cervical and first dorsal vertebræ are figured in Plates 23—28.

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Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5.

Fig. 1. Tail of the Okapi presented to the British Museum by the late Mr. Boyd Alexander.
Fig. 2. Tail of the Okapi presented to the British Museum by Sir Harry Johnston.
Fig. 3. Tail of the Okapi presented to the British Museum by Major Powell-Cotton.
Fig. 4. Tail of an incomplete and unmounted skin of Okapi presented to the British Museum by the late Mr. Boyd Alexander.
Fig. 5. Tail of an incomplete and unmounted skin of a young Okapi presented to the British Museum by Major Powell-Cotton.

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Fig. 1.

Fig. 2.

Diagrams of hair-whorls and hair-streams on the fronto-parietal region of the head of the Okapi. From 'Proc. Zool. Soc.,' 1903, ii, pp. 338 and 339, text-figures 41 and 42.

Fig. 1. Specimen presented to the British Museum by Sir Harry Johnston. b, b, paired bare spots corresponding in position to the horns of the male; mediad of the right-hand spot is a bare patch caused by rubbing; it is not represented on the left-hand side of the head; d, single supra-nasal vortex or meeting point of three hair-streams; x, single spiral whorl on the left frontal region, asymmetrical in position; y, occipital radiating centre.

Fig. 2. Specimen in the Hon. Walter Rothschild's museum at Tring. a, median inter-cornual spiral whorl and meeting-point of hair-streams, not present in fig. 1; b, b, as in fig. 1; c, c, right and left inter-cornual radiating centres, not present in fig. 1; y, as in fig. 1.

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